

Naval Health Research Center

***1997 Command History
for
Naval Health Research Center
San Diego, California***

August 2000

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NAVAL HEALTH RESEARCH CENTER
P.O. BOX 85122
SAN DIEGO, CALIFORNIA 92186-5122

NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND
BETHESDA, MARYLAND



**1997 Command History
for
Naval Health Research Center, San Diego, California**

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## **1. BASIC HISTORICAL NARRATIVE**

### **Historical**

Jun 1959. The Naval Health Research Center, one of eight laboratories supported by the Naval Medical Command (previously the Bureau of Medicine and Surgery), and administered through the Naval Medical Research and Development Command, was established effective 1 June 1959 (SECNAVNOTICE 5450 Op-09B23 Serial 360P09B2 dated 8 May 59). Originally designated the Navy Medical Neuropsychiatric Research Unit, its assigned mission was "To conduct research in the area of neuropsychiatry as it applies to the naval service." (BUMEDINST 5450.64B).

Sep 1974. In recognition of the broader research programs which developed over the years, effective 1 September 1974, by authority of the Chief of Naval Operations, the activity was redesignated as the Naval Health Research Center (OPNAVNOTE 5450 Ser 09B33/4248 dated 5 Aug 74). The revised mission statement read: "To conduct research and development on the medical and psychological aspects of health and performance of naval service personnel; and to perform such other functions or tasks as may be directed by the Chief, Bureau of Medicine and Surgery." The Center for Prisoner of War Studies (CPWS), established in 1973, was disestablished in 1978. The Center's infectious disease program was terminated in 1983 due to transfer of this responsibility to the Army.

**a. Command's Mission:** To support fleet operational readiness through research, development, test, and evaluation on the biomedical and psychological aspects of Navy and Marine Corps personnel health and performance, and to perform such other functions or tasks as may be directed by higher authority.

**b. Description of Command's Organization:**

|                                   |              |                             |
|-----------------------------------|--------------|-----------------------------|
| Commanding Officer                | (Code 00):   | Larry M. Dean, CAPT MSC USN |
| Executive Officer                 | (Code 01):   | John T. Coyne, CAPT MSC USN |
| Scientific Director               | (Code 02):   | D. Stephen Nice, Ph.D.      |
| Administrative Officer            | (Code 03):   | Eddie A. Lee, CDR MSC USN   |
| Command Chief                     | (Code 00A):  | HMC Jose Reyes, USN         |
| Consultant for Scientific Affairs | (Part time): | E. K Eric Gunderson, Ph.D.  |

**Scientific Departments:**

- \* Code 21, Human Performance  
Head: William Keith Prusaczyk, PhD
- \* Code 22, Medical Information Systems & Operations Research  
Head: William M. Pugh
- \* Code 23, Health Sciences and Epidemiology  
Head: Frank Garland, PhD

**Immediate Superior in Command:**

Commanding Officer, Naval Medical Research and Development Command, Bethesda, Maryland.

**c. Description of 1997 Mission Accomplishments**

**(1) Human Performance Department (Code 21)**

See Attachment A for Department review.

**(2) Medical Information Systems & Operations Research Department Code 22)**

See Attachment B for Department review.

**(3) Health Sciences & Epidemiology Department, Code 23**

See Attachment C for Department review.

**2. SPECIAL TOPICS**

**a. Statistics on major functions such as volume of logistic support, maintenance work, training, or recruiting:**

**(1) Library Support:**

The NHRC Wilkins Biomedical Library (WBL) support includes:

- receiving from military, academic and private institutions and individuals world-wide, requests for copies of NHRC reports; and
- the WBL borrows approximately 1000 items each year and supplies 1500+ journal articles to other libraries, many of which are Navy and Defense Department libraries.

**(2) Training:** Staff participation for in-house training is 100%.

- In-house training includes, but is not limited to, Equal Employment Opportunity functions, opportunities for Total Quality Leadership (TQL), and sexual harassment. Flyers and messages regarding sexual harassment are provided in the command's Plan of the Week.
- Training for professional staff is conducted by staff, or visitor presentations on monthly basis of their specialty work, or currently work on a work unit study.
- Civilian Personnel office sends announcements by E-mail of training available to Civilians.
- Safety training is scheduled on a monthly basis.
- CPR certification and re-certification is provided on a quarterly basis.
- All staff members are encouraged to take advantage of the numerous private one-, two-day training programs available year round.
- Throughout the year the command provides training to numerous Ensigns, Medical Corps on a ADT/OJ clerkship in preventive medicine/sports medicine/research neurology/epidemiology

## 1997 Command History-NHRC

(3) Recruiting: Although the command does not have a recruiting program, on occasion contract employees or students onboard, from San Diego State University or University of California San Diego assisting in the various research programs, will inquire about the Navy programs available to graduate students.

### **b. Military and Civilian Personnel onboard as of 31 Dec 97:**

59 Civilians (4 Part-time)

25 Military (13 Officers, 10 Enlistees)

23 Contractors (GEO, Uniband, Jackson Foundation, Anteon, MACC, UCSF, UA)

### **c. Major 1997 command problems faced:** None.

#### **(1) Significant changes during 1997:**

(Jan) HMC(SW/AW/FMF) Edward D. Ortiz, USN, reported onboard 24 January as Incoming Command Chief, to relieve HMC Jose V Reyes, USN, who is on terminal leave.

(Jan) Throughout 1997, the Naval Medical Center San Diego has let NHRC staff use their video in Building 5 for teleconferences.

(May) Command Chief HMC Jose V. Reyes, USN, retirement was effective 31 May 97.

(Sep) Dr. John Silva, Senior Scientist, of the Medical Information and Operations Research Department, accepted a new position with the Space and Naval Warfare System Command (SPAWAR) as Technical Director of the Advanced Technology and Prototype Program Directorate (PD-13T). His last day was 27 September.

(Oct) On the 1st, Dr. Keith Prusaczyk, Research Physiologist, was recently appointed as Head, Human Performance Department. Dr. Prusaczyk holds a Ph.D. in Physiology from the University of Georgia. He has been with NHRC for seven years.

#### **(2) Noteworthy events during 1997:**

(Feb) NHRC and the Human Performance Department under the direction of Dr. James Hodgdon, worked with a crew from the "Good Morning America Show" on Thursday, February 13th. The focus broadcast segment is to report on the scientific findings relating to cold stress and the gender differences in cooling while in an extreme cold weather environment. Dr. Don Roberts was in the foreground orchestrating the duplication of scientific testing conducted within the Department, utilizing NHRC personnel and the Good Morning America scientific reporter in an actual cold weather. The segment aired on Tuesday, February 18th.

(May) NHRC has been designated as the Navy Node for the Department of Defense Infectious Disease Surveillance and Response System (DoD SR&S). The System was developed in response to a Presidential directive and approved by the Surgeon Generals of the three services. The mission of the SR&S is to conduct active surveillance of infectious diseases that might affect our military personnel, their dependents, or the safety of U.S. citizens. NHRC was funded \$200k for its role as Navy Node for 1997.

Other Nodes, the central DoD Node is at Walter Reed Army Institute of Research (WRAIR), an Air Force Node is at Brooks AFB, and an Army Node is at the U.S. Army Center for

**(2) Noteworthy events (cont.)**

Health Promotion and Preventive Medicine. Major data collection points around the globe are Naval Environmental Health Center (NEHC), Norfolk; Navy's foreign labs in Cairo (NAMRU-3) and Jakarta (NAMRU-2); and the Army labs in Brazil, Thailand, and Kenya.

(May-Aug) This command continues to promote the American Society for Engineering Education (ASEE) summer research program. The ASEE program provides the college and university faculty members the opportunity to establish continuing research relations and to expand their professional contacts with the R&D community which experience is beneficial both personally and professionally.

Arriving on 27 May and departing on 1 August, the two 1997 ASEE members were: Giles Warrack, Ph.D. from North Carolina A&T, to Code 23, Dr Hourani Jacquelyn W. White, Ph.D., from the University of North Carolina at Greensboro, to Code 22, Dr. Merrill.

(Jun) On the 30th, the CO, XO, CDR Luz and Dan Rahilly attended Kernel Blitz Exercises at Camp Pendleton and met with RADM Engel. LT William Deniston and Dr. John Silva from Code 22, also participated in the Kernel Blitz Exercise testing the Mobile Medical Monitory (M3) System.

(Jun-Aug) This command receives medical students from the various universities and colleges throughout the United States to perform a clinical clerkship. The students are responsible for obtaining their ACDUTRA orders via the Health Sciences Education and Training Command in Bethesda, MD. Their tours range from 14-, 24- or 48-day ACDUTRA. This year's clerkship students went to LCDR Shaffer in Code 23.

For 15 days, reporting onboard 24 February and departing 12 March:

LCDR Joanne Shields, MSC, USNR, State Department of Health, Olympia, Washington

For 45 days, reporting onboard 2 June and departing 15 July:

ENS Linh Du, MC, USNR, Medical College at Virginia, Richmond

ENS Anthony Biascan, MC USNR, Creighton University, Omaha, Nebraska

ENS Marcus Talerico, MC, USNR, Loloya University, Chicago, Illinois

(Aug) The CO, XO, SD attended the Surgeon General's Conference in Arlington, VA, held 25-29 Aug.

(Sep) Disestablished 30 September, through an organization realignment, Naval Command, Control and Ocean Surveillance Center (NCCOSC), or referred to as NRAD, was reassigned and assigned new title Space and Naval Warfare Systems Center (SPAWARSYSCEN) San Diego. Captains Dean and Coyne attended the transition ceremony

(Sep) On the 8th, 0800-1000, RADM Koenig visited the command. He was given a command brief and a tour of working spaces.

(Sep) On the 24th, the CO and XO were invited to attend the final graduation and closing ceremony of Basic Hospital Corps School, held at the Organ Pavilion, Balboa Park.

(Oct) Staff members attended the California BioSumit 97 meetings held in San Diego, 7-9 October.

(Nov) A new performance appraisal system was developed. Final review was held with members from the Human Resource Officer and Department Heads on the 20th.

**(2) Noteworthy events (cont.)**

(Nov) The CO and XO attended the annual Commanding Officers Conference held in San Antonio, Texas , 11-14 November.

**d. Major facility developments, including new construction and base right agreements.**

The Human Performance Department's Bldg 74 MILCON project. After contract and funding problems were resolved, the site preparation was initiated. A ground water problem in one area caused a delay. The Project completion date moved to the third week in September with a move in date the first week of October.

**e. Major accidents or casualties:** None

**f. Storage or disposal of hazardous waste:**

The Center does not store hazardous waste. Generated hazardous waste is disposed of by NRAD, whose command name, on 1 Oct 97, changed Space and Naval Warfare Systems Center (SPAWAR), San Diego.

**g. Community Relations (including disaster relief):**

- The command continues to participate in the annual Combined Federal Campaign, Navy and Marine Corps Relief, and Navy Technology Transfer Program.
- In November, the command continues to participate in and support the Great American Smokeout campaign headed by the Commander, Naval Medical Center San Diego.
- Students from San Diego State University (SDSU), the University of California at San Diego (UCSD), Point Loma Nazarene College, and City College are utilized in the various departments as research assistants, psychology and/or statistical technicians, and administrative support.
- Several members of our staff continue to teach in the evening at local colleges. Almost all of our senior scientists hold Adjunct Professorships at the local universities. These ties with local universities and colleges serve to keep our researchers up-to-date with the latest academic advances in their fields. These appointments also reflect a high level of acceptance of many of our staff and their work by academic appointment committees.

**h. Records set or other unique and unusual events:**

Safety Issue. For 1997, of 59 civilians and 23 contractor employees, NHRC incurred two civilian and one contractor injuries while on duty which resulted in no employee work time lost. Of 25 military staff, no on-duty injury was recorded, however, one off duty injury/accident was recorded and resulted in no work time lost.

**i. Aircraft assigned:** N/A

**c. Description of 1997 Mission Accomplishments**

**(1) Human Performance Department (Code 21)**

Keith Prusaczyk, Head

**(a) Department Mission:** This department conducts research related to the measurement restoration, enhancement, and modeling of human performance in military operational environments. Emphasis is on the measurement and understanding of the processes that lead to physical and mental performance degradation, development of countermeasures to maintain or enhance performance and the development of standards which allow safe and effective performance of Navy and Marine Corps personnel. Functions with four divisions

1 Performance Modeling and Standards Division (211). Conducts research to develop mathematical models of the relationships between human physical and mental abilities and performance in Navy and Marine Corps tasks. Models incorporate effects of exposure to factors such as thermal extremes, sleep loss, and related aspects of military operations and training. Products include computer models constructed to permit decision makers to evaluate the potential effects of tactical choices on performance effectiveness. Performance predictions from the models are applied to evaluate and demonstrate to potential impact of alternative selection standards on unit readiness and performance.

2 Cognitive Performance Division (212). Performs research on factors which impact performance of Navy and Marine Corps personnel, and the development of interventions to maintain or enhance that performance. Emphasis is on effects of biological rhythms, sleep, sleep deprivation, and fatigue on performance, the development of methods for evaluating the alertness of personnel engaged in operational tasks, and development of appropriate work/rest cycles and shift-work guidelines to optimize health and safety of Navy and Marine Corps personnel.

3 Applied Physiology Division (213). Directs research in the areas of occupational and environmental physiology. Focus is on quantification of performance, understanding of the processes which effect the physiology of performance, and the development of countermeasures to maintain or enhance performance in military environments.

4 Special Operations Division (213). Conducts applied research as it relates to enhanced performance of Special Operations Forces (SOF). Develops medical standards for SOF personnel; and, conducts research in stress physiology related to mission performance.

**(b) Research program descriptions (work units):**

**New:**

DN249525 (62233N MM33P30.002) 63706N M0096.002-6801  
Environmental and Mission Stressors during Navy and Marine Corps Special Operations  
(Ahlers) Start: 10-1-97

DN249524 62233N MM33P30.002-6807  
Countermeasures to Physical Performance Decrements during Navy and Marine Corps  
Special Operations (Goforth) Start: 1 Oct 97

1997 Command History-NHRC/Code 21

**(b) Research program descriptions (work units) cont:**

**New (cont):**

DN249526 63706N M0096.002-6811  
Heat Strain Monitoring and Energy Cost of Damage Control Operations (Ahlers)  
Start: 10-1-97

DN249528 63706N M0096.004-6813  
Neck and Back Strain in Airborne Early Warning Aviators (Ahlers) Start: 10-1-97

DN240624 63706N M0096.002-6716  
Occupational Fitness or Sustained Operations (Vickers) Start: 10-1-97

**Continuations:**

DN241232 62233N MM33P30.002- 6603  
Cold Induced Perturbations in Peripheral Blood Flow: Implications for Performance and  
Injury Risk (Ahlers) Start: 10-1-95

DN244582 60407(4)N 407BB.001- 6419  
Glare Disability after Photorefractive Keratectomy (Schallhorn/ Goforth) [NHRC has Rifle  
Study only] Start: 10-1-93

**Terminations/Completions:**

DN240549 62233N MM33P30.002-6701 (PI Resigned, no work started.)  
Circadian Rhythm Effects of Periodic Bright Light Exposure (Kelly)  
Start: 10-1-96 Term: 1-10-97

DN240550 62233N MM33P30.002-6702 (PI Resigned, no work started.)  
The Maintenance of Wakefulness Test (MWT) as a Measure of Stimulant Effects (Kelly)  
Start: 10-1-96 Term: 1-10-97

DN241270 63706N M0095.001-6612  
Visual Recovery after Photorefractive Keratectomy (Goforth)  
Start: 10-1-95 Comp: 9-30-97

DN241121 63706N M0096.002-6501  
Physiological Heat Exposure Limits for Female Shipboard Personnel (Heaney)  
Start: 10-1-94 Term: 9-30-97

DN244577 62233N MM33P30.002- 6412  
Development of Performance Enhancement Methodologies for Special Operations  
Personnel (Goforth) Start: 10-1-93 Comp: 9-30-97

DN244578 62233N MM33P30.002- 6413  
Navy & Marine Corps Special Operations Personnel Performance (Goforth)  
Start: 10-1-93 Comp: 9-30-97

DN244545 63706N M0096.002- 6415  
Human Performance of Naval Personnel during Damage Control Operations in Protective  
Overgarments (Bennett/Hagan) Start: 10-1-93 Comp: 9-30-97  
NAVSEA Reimb-6415 **Study C:** Work/Rest Guidelines for Personnel Dressed in Protective Garments  
NAVSEA Reimb-6415 **Study D:** Heat Stress and Perceptual Responses during Shipboard Firefighting  
NAVSEA Reimb-6415 **Study E:** Effect of Anti-exposure Suits on Performance during Shipboard Flooding



**(b) Research program descriptions (work units):**  
**Terminations/Completions (cont):**

DN244544 63706N M0096.002-6416

Neck and Back Strain in Combat Aviators (Pozos/Hodgdon)

Start: 10-1-93

Comp: 9-30-97

DN244573 63706N M0096.002-6417

Modeling of Human Performance in SUSOPS (Hodgdon)

Start: 10-1-93

Comp: 9-30-97

**(c) Significant accomplishments for January-December 1997**

- \* Analysis of physical demand ratings for Navy enlisted ratings indicated that about 44% of Navy occupations can be classified as physically demanding. Risk of musculoskeletal injury increases disproportionately for the physically demanding jobs. This finding has implications on physical fitness training and testing and for the current Department of Defense physical fitness instruction which calls for occupation-specific fitness standards. (NHRC TR 97-33)
- \* Work/rest cycles for shipboard firefighting were developed and delivered to NAVSEA.
- \* A computer model to simulate neck and back strain with use of various aviation helmets was developed.
- \* NHRC personnel visited the USS Constellation where they advised shipboard personnel on best times of day to collect environmental temperature recordings.
- \* Evaluated stay times of personnel working in hot shipboard compartments with and without use of a cool vest aboard the USS Constellation.
- \* Evaluated an anti-exposure suit developed by Naval Clothing and Textile, finding that the suit provided protection against decreases in body temperature during short-term immersion in cold water during pipe- and hull-patching activities. (NHRC Report 97-11).
- \* Examined the effects of exercise mode (upper-body versus lower-body exercise) on heat strain when cooling was provided by liquid-based microclimate cooling. (NHRC Report 97-17).
- \* Determined the effectiveness of three different liquid-based microclimate cooling perfusate temperatures to reduce heat strain in personnel required to walk on a treadmill for 60 min in a hot-humid environment. (NHRC Report 97-22).
- \* Demonstrated that finger temperatures of males working in a cold environment remained significantly warmer than finger temperatures of females working in the same environment. The findings suggest that short-term exposure to cold may place women at a greater risk for cold injury to the fingers than men. (NHRC TR 97-37).
- \* Evaluated a commercially available dehydrated ration (AlpineAire) as an alternative to military rations for use during a mission exercise in a wet-cold environment. The commercial rations were lighter in weight and comparable in taste and convenience to

**(c) Significant accomplishments for Jan-Dec 97 (cont.)**

military rations; however, they required more water and longer preparation time. Therefore, the commercial ration does not appear to be superior to military rations. (NHRC Tech Document 97-5E).

- \* Participated in the Technical Cooperation Program: Technical Panel-8, which updated the compendium on ergogenic aids, titled "Assessment for Potential Ergogenic Aids for Special Operations," a guide designed for assisting medical officers in supervising the use of proven enhancement methods.
- \* Nutritional supplement use by Navy and Marine Corps personnel was documented. This information is being reviewed by higher authority and may be used to develop command instructions and policies on ergogenic use.
- \* In collaboration with Yale University Medical School, determined time course for muscle glycogen supercompensation. This information is of value to Special Forces personnel and others who face prolonged, rigorous physical activity.
- \* Demonstrated that short-term creatine supplementation was not effective in enhancing performance of an abbreviated special operations obstacle course. This indicates that the one-time performance of an intense mission task may not be improved by 5 days of creatine supplementation.

**(d) Changes in departmental mission, functions, and resources.**

The Human Performance Department changed Department Heads in FY97, with W. Keith Prusaczyk, Ph.D. replacing James A. Hodgdon, Ph.D.

Across-the-board funding cuts from Naval Medical Research and Development Command plus personnel attrition resulted in the loss of the Cognitive Performance Division.

**(e) Major accomplishments**

Using the Human Performance Department's extensive body composition data base, new circumference-based body fat estimation equations for males and females were developed using a four-compartment body composition model. These new equations have been adopted for use by the U.S. Marine Corps, replacing equations based on older body composition models (ALMAR 326/97, dated 10/01/97).

**(f) Impact on Navy and Marine Corps mission.**

Research accomplishments from the Human Performance Department for 1997 have impacted the Marine Corps in the way they perform body fat measurements. The new equations are based on a more accurate criterion (the four-compartment body composition model) without the known racial bias of the old criterion (the two-compartment body composition model).

Further, Human Performance Department accomplishments have the potential to affect the Navy and Marine Corps in the following ways:

- In the way personnel are evaluated and trained for physically demanding jobs, including Special Operations forces.

**(f) Impact on Navy and Marine Corps mission (cont.)**

- In the development and acquisition of protective equipment (anti-exposure suits, aviation helmets) used by Naval and Marine Corps personnel.
- In the protection of personnel working in extreme hot or cold environments.

**(g) Technology transfer items of interest.**     None.

**(h) Department Reports for 1997 include:**

(See 'Section 3. Supporting Documents' for list of 1997 Reports with abstracts)

- 97-6     Law, PG; HW Goforth Jr., SE Kaupp, WK Prusaczyk, K Schneider, & J Reid (1997). Efficacy of Downhill Running to Prepare Personnel for Mountain Hiking with Pack Weight     (Center Publication, A326-083)
- 97-8     Puppione, DL; HW Goforth Jr., & SE Kaupp (1997). The Effect of Dietary Saturated Fat on the Production of Chylomicara Enriched in Saturated Fat     (Center Publication, A326-213)
- 97-9     Cohen, BS; SJ Feith, & WK Prusaczyk (1997). The Effects of Wearing a Disposable Eye/Respiratory Protection (DERP) Mask in Environmental Extremes     (Center Publication, A327-982)
- 97-10    Buono, MJ; JH Heaney, & MK Canine. Acclimation to Humid Heat Lowers Resting Core Temperature
- 97-11    Hagan, RD; RD Bernhard, BS Cohen, JA Hodgdon (1997). Effect of Anti-exposure Suits on Body Temperatures during Shipboard Flooding Activities     (Center Publication, A327-981)
- 97-12    Schallhorn, S; SE Kauppp, CL Blanton, L Zoback, H Goforth, CW Flowers & PJ McDonnell (1998). Topographic Detection of Photorefractive Keratectomy. Ophthalmology, 105(3), 507-516. A375-320
- 97-17    Canine, MK; B Bothorel, C Habib, DW Trone, G Vurbeff, & RS Pozos (1997). Thermoregulatory Consequences of Upper Body versus Lower Body Exercise. (Center Publication, A328-063)
- 97-22    Canine, MK, CM Habib, R Bernard, A Ashinger, GK Vurbeff, RS Pozos, & JA Hodgdon (1997). The Effect of Perfusate Temperature in a Liquid Cooling System on Heat Strain and Heat Transfer     (Center Publication, A335-481)
- 97-33    Vickers, RR Jr.; LK Hervig, & MR White (1999). Job Demands and Back Injury in Navy Personnel     (Center Publication, A370-142)
- 97-34    Vickers, RR Jr.; LK Hervig, E Walton, R Kanfer, & PL Ackerman. Personality Change during Military Basic Training
- 97-37    Reading, JE; DE Roberts & WK Prusaczyk (1998). Gender Differences in Finger Temperatures during Cold Air Exposure.     (Center Publication)

**Technical Document**

- 97-5E    Schneider, KE; HW Goforth Jr., & B Day. Dietary Intake by SEALs Consuming Self-selected and Prescribed Rations during Mission Exercise in the Arctic

**c. Description of 1997 Mission Accomplishments**

**(2) Medical Information Systems and Operations Research Department  
(Code 22)**

William Pugh, Head

**(a) Department Mission.** This department plans and conducts research programs designed to study the processing of medical information, develop improve methods of medical information management, and project the effects of illness trends on combat force.

1. Medical Information Systems Division (221). Initiates research to develop improved medical information processing for medical providers and planners. The systems are designed to improve recordkeeping capabilities, facilitate the continuity of patient care, provide efficient access to medical reference information, support diagnostic and treatment discussions, and allow information on illness trends to be accessed and monitored.

2. Operations Research Division (222). Formulates research to project the effects of epidemiologic trends. Models are developed, simulations are conducted, and statistical forecasting techniques are used to project the effects of illness and injury. Results are used to develop improved strategies for the allocation of medical resources.

**(b) Research program descriptions (work units):**

**NEW:**

|                                                                                  |                 |
|----------------------------------------------------------------------------------|-----------------|
| DN240609 63706N M0095.005-6804                                                   |                 |
| An Analysis of Navy and Marine Corps Medical Research Requirements (Van Orden)   | Start: 10-1-97  |
| DN240610 63706N M0095.005-6805                                                   |                 |
| Augmentation of Field Medical Surveillance System (White)                        | Start: 10-1-97  |
| DN240613 63706N M0095.005-6808                                                   |                 |
| Development Real-time Resupply Model (Konoske)                                   | Start: 1 Oct 97 |
| DN240614 63706N M0095.005-6809                                                   |                 |
| Determining Medical Supply Requirements for Navy Ships (Konoske)                 | Start: 1 Oct 97 |
| DN240615 1160407BB.001-6810                                                      |                 |
| Special Operations Interactive Medical Training Program Upgrade (Hermansen)      | Start: 1 Oct 97 |
| DN249527 63706N M0096.001-6812                                                   |                 |
| Measuring the Effectiveness of Telemedicine (Konoske)                            | Start: 1 Oct 97 |
| DN234880 61152N M0004.001-6815                                                   |                 |
| Objective Correlates of Work Overload and Loss of Situational Awareness (Makeig) | Start: 1 Oct 97 |
| DN234879 63105A 00101.KHX- 6816                                                  |                 |
| Transition of a Successful Skills-building HIV/STD Intervention (Kewley)         | Start: 1 Oct 97 |

**(b) Research program descriptions (work units):**

**NEW (cont):**

DN240587 63706N MM2285.001-6703(b)  
Head Trauma Emergency Response Simulation (Silva) Start: 2-1-97

DN240618 63706N M2332.001-6710  
Assessment of Mobile Medical Monitoring in Naval Environments (Silva) Start: 5-19-97

DN240612 [62233N MM33P30.002-] 63706N M0095.005-6714  
Fatigue/Sleep Monitoring, Assessment, and Prevention (Makeig) Start: 6-1-97

DN240623 NRaD Reimbursable-6715  
Workload Assessment Tools: Subtask 9 of the Multimodal Watchstation Thrust of the  
SC21 Manning Affordability Initiative (Van Orden) Start: 6-1-97

**Continuations:**

DN242642 PERS Reimb- 6309  
Survey of Navy Recruits' Behavior (Merrill)  
Study A: Survey of Recruits Start: 4-15-93  
Study B: Longitudinal Tracking Start: 10-1-95

DN244632 63706N M0096.004-6509 **(original assigned number was 6428)**  
Development of an Expert System for Shipboard Industrial Hygiene Survey Planning  
(Hermansen) Start: 6-1-94

DN240552 63706N M0095.005-6704  
Development of Planning Factors to Forecast Medical Support Requirements (Blood)  
Start: 10-1-96

DN241208 63706N M0096.001-6601  
Modeling and Simulation of Telemedicine Applications to Fleet Operational Medical  
Treatment Facilities (Konoske) Start: 10-1-95

**Completions/terminations:**

DN240551 62233N MM33P30.002-6703(a)  
Visual Correlates of Fatigue (Neri) (PI Transferred in January)  
Start: 10-1-96 Term: 1-10-97

DN241252 Army Reimbursable-6606  
The Variability of Electrophysiological and Neurobehavioral Measures of Alertness in  
Women and Men (Neri, Van Orden) Start: 12-22-95 Comp: 4-30-97

DN241151 63706N M0095.005-6508  
Augmentation of the Hand-held Field Documentation Device (Konoske)  
Start: 10-1-94 Comp: 9-30-97

**(b) Research program descriptions (work units):**  
**Completions/terminations (cont):**

DN241152 63706N M0095.005-6510 **(merged with 6809)**  
 Development of Combat Casualty Flow Models for Optimizing AMAL/ADAL Supply  
 Configurations (Konoske) Start: 10-1-94 Term: 9-30-97

DN241157 63706N M0096.002- 6512  
 Development of An Expert Out-patient Clinic Analysis System for Operational Medical  
 Treatment Facilities (White) Start: 10-1-94 Comp: 9-30-97

DN241163 ONR Reimb-6513 **(merged with 6429)**  
 Visual Information Processing Assessment of Human-System Interface Development (Van  
 Orden) Start: 2-2-95 Term: 1-10-97

DN244620 63706N M0096.001- 6426  
 Application of Telecommunication in Shipboard Medicine (Silva)  
 Start: 6-1-94 Comp: 9-30-97

DN244631 63706N M00956.001-6427  
 Enhancing Medical Care: A Human Factors/Quality Assurance Program (Pang)  
 Start: 10-1-93 Comp: 9-30-97

DN244630 ONR & NPRDC Reimb-6429  
 Neural Human-Systems Interface Development (Makeig/Van Orden)  
**title changed 1/97: Operator State Assessment Program (Van Orden)**  
 Start: 10-1-93 Comp: 9-30-97

DN244580 60407N 407BB.001- 6307  
 Computer Assisted Naval Special Warfare Corpsman Training Program (Hermansen)  
 Start: 3-30-93 Comp: 9-30-97

**(c) Significant accomplishments (Jan-Dec 97)**

- \* Dr. Paula Konoske. For our work on a hand-held field documentation device, efficiency and effectiveness data for three types of data input methods (voice, two-button, and keyboard) were collected. In general, the speech recognition method was found to be slower, yet somewhat more accurate, than either the keyboard or the two-button method. The novelty of the speech recognition system could account for these findings. Viewed in this light, voice holds much promise as a mode of input for medical documentation. Future work will focus on expanding the vocabulary available to the users for documentation, thus making the interaction more consistent with the way they actually perform their jobs.
- \* Dr. Paula Konoske. Designed and developed a computer model that estimates the medical documentation storage requirements for the Personal Information Carrier (PIC).
- \* Dr. Stephanie Kewley. For the project entitled "Enhancing Medical Care: A Human Factors/Quality Assurance Program," a new survey system was used to collect 482

**(c) Significant accomplishments, Jan-Dec 97 (cont):**

medical incident reports. These included adverse events, near miss incidents, workplace concerns, and positive events. The survey system was received positively by the staff, and the incident reports resulted in numerous corrective actions taken to reduce the likelihood of adverse incidents.

- \* Dr. Scott Makeig and LCDR Karl Van Orden. For the Operator-State Assessment Program, Signal processing algorithms used to identify spectral changes in the EEG associated with alertness lapses continue to be developed and improved. The Alertness Monitoring and Management (AMM) algorithm is currently capable of identifying subminute scale fluctuations in alertness.
- \* Dr. Lex Merrill. For the project entitled Survey Of Navy Recruits' Behaviors Study B: Longitudinal Tracking, data collection from 5,000 female and 6,000 male recruits was successfully completed in June 1997. Follow-up surveys have been sent to 3,000 female and 3,000 male recruits.
- \* Larry Hermansen. Developed a prototype expert system for U.S. Navy industrial hygienists. The system automatically provides checklists for evaluating and entering data about possible problems for each of the NAVOSH programs as well as for workplaces in each of the departments.
- \* Dr. John Silva. For the Head Trauma Emergency Response Simulation Project, a website was created and maintained to provide the following software and development aids for collaborators: (1) a Trainer/StateEngine Communications Protocol to link the algorithms with the VR Trainer; (2) a description of the Finite State Automata (FSA), a dynamic mathematical model for developing casualty simulations. The FSA depicts the critical states through which a patient passes, given (or not given) various treatments and drug therapy; (3) a Catalog of Procedures (examination and treatment options) that serves as a master list of potential behaviors from which to build the training scenarios; (4) a Catalog of Unsolicited Patient Messages, i.e., spontaneous patient behaviors; (5) a Catalog of Anatomic Sites depicting how the patient's body will be segmented for VR Trainer recognition and display; (6) brief DEPMED and extensive clinical case descriptions, initial visual findings, teaching points, and potential student pitfalls; (7) casualty photographs in the form of TIF files to help develop the VR Trainee.
- \* Chris Blood. A Working Group devoted to casualty sustainment and medical modeling was convened at the Military Operations Research (MORS) symposium held at the Marine Corps Combat Development Command in Quantico to discuss methodologies for determining resource requirements.

**(d) Changes in departmental mission, functions, and resources.**

None.

**(e) Major accomplishments**

- \* Dr. Paula Konoske. Designed and developed a computer model to estimate supplies and equipment based on a given patient stream distribution. The model allows estimates of supply requirements based on a scenario-specific patient stream to be compared with existing AMALs. This, in turn, can help reduce the logistical burden Marine Corps units carry. By establishing a link between theater medical procedures and injury conditions and using a defined patient stream, medical supply decisions can be more closely matched to Marine Corps requirements, creating a substantial improvement over the current system. Through the process of establishing the clinical requirement for each supply item, an audit trail is produced which gives logisticians and medical planners an objective management tool for maintaining and upgrading AMAL Class VIII medical materiel.
- \* Larry Hermansen. Special Operations Interactive Medical Training Program Version 4.0 was completed and distributed to Special Operations Forces of the Navy, Army, and Air Force. This version contains 21 modules.

**(f) Impact on Navy and Marine Corps mission.**

- \* Dr. Stephanie Kewley. Results from survey of medical incident reports resulted in numerous corrective actions taken to reduce the likelihood of adverse incidents.

**(g) Technology transfer items of Interest.**

- \* Dr. Scott Makeig. Methodology and algorithms developed at NHRC for detecting drowsiness-related changes in the electroencephalographic (EEG) spectrum were applied to National Highway Traffic Safety Administration research aimed at developing automated alertness monitoring systems for commercial truck drivers.

**(h) Reports for 1997 include:**

(See 'Section C, Supporting Documents' for list of 1997 with abstracts)

- 97-2 Merrill, LL; CE Newell, LK Hervig, S Booth-Kewley, LA Patriarca, & PA Gilman (1997). Pre-enlistment Maltreatment Histories of U.S. Navy Basic Trainees: Prevalence rates for the 2<sup>nd</sup> quarter of 1994 and the 4<sup>th</sup> quarter of 1996 (Center Publication, A331-444)
- 97-3 Galarneau, MR; KJ Mahoney, PJ Konoske, & KE Emens-Hesslink (1997). Development of a Model for Predicting Medical Supply Requirements at the Forward Echelons of Care: Preliminary Findings for Echelon II Lab and X-ray Ancillaries (Center Publication, A323-436)
- 97-4 Merrill, L; CE Newell, JS Milner, LK Hervig, & SR Gold (1998). Prevalence of Pre-military Adult Sexual Victimization and Aggression in a Navy Recruit Sample. Military Medicine, 163(4), 209-212 (1997 Center Publication, A331-445)
- 97-5 Merrill, LL; CE Newell, SR Gold, & JS Milner (1999). Childhood Abuse and Sexual Revictimization in a Female Navy Recruit Sample. Journal of Traumatic Stress 12, 211-225. (1997 Center Publication, A331-433)



**(h) Reports for 1997 (cont):**

- 97-21 Booth-Kewley, S & K Freeman (1997). Enhancing Medical Care: The Computerized Critical Incident Technique (CCIT) Survey. (Center Publication, A331-452)
- 97-25 Burr, RG; LL Merrill, & K Emens-Hesslink (1997). U.S. Navy Women's Satisfaction with Obstetric and Gynecologic Medical Care (Center Publication, A331-426)
- 97-27 Gauker, ED & R Reed (1997). Medical Diagnosis in Operations Other Than War (OOTW): Relationship to DEPMEDS Patient Conditions (Center Publication, A331-438)
- 97-28 Galarneau, MR; PJ Konoske, KE Emens-Hesslink, G Pang, & ED Gauker (1997). A Model for Predicting Medical Supply Requirements at the Forward Areas of Care: Battalion Aid Stations (Center Publication, A331-422)
- 97-39 Blood, CG; JM Zouris & D Rotblatt (1998). Using the Ground Forces Casualty Forecasting System (FORECAS) to Project Casualty Sustainment. (Center Publication, A339-487)
- 97-41 Jung, T-P; S Makeig, AJ Bell & TJ Sejnowski. Independent Component Analysis of Electroencephalographic and Event-related Potential Data
- 97-42 McKeown, MJ; S Makeig, GG Brown, T-P Jung, SS Kindermann, AJ Bell, & TJ Sejnowski. Analysis of fMRI Data by Blind Separation into Independent Spatial Components
- 97-43 McKeown, MJ; T-P Jung, S Makeig, GG Brown, SS Kindermann, T-W Lee, & TJ Sejnowski. Transiently Task-related Human Brain Activations Revealed by Independent Component Analysis

**Technical documents**

- 97-1A Jaeger, JA; MR White, & IT Show (1997). Epidemiological Interactive System (EIPSYS) User's Guide, Version 1.0 (Center Publication, A326-215)
- 97-3C Blood, CG; JS Mark, & LP Le (1997). Using the Shipboard Casualty Projection System (SHIPCAS) to Forecast Ship Hits and Casualty Sustainment. (Center Publication, A326-228)
- 97-6F Emens-Hesslink, KE; PJ Konoske, & ED Gauker (1997). MEDTAB & METRAK User's Guide. (Center Publication, A331-550)
- 97-7G Matheny, SA; DC Keith, SC Sundstrom, & CG Blood (1997). A Medical Planning Tool for Projecting the Required Casualty Evacuation Assets in a Military Theater of Operations. (Center Publication, A335-748)

**c. Description of 1997 Mission Accomplishments**

**(3) Health Sciences and Epidemiology Department (Code 23)**

Frank Garland, Ph.D., Head

**(a) Department Mission.** This department conducts research and evaluations in areas such as Health and Physical Readiness, Alcohol Rehabilitation, Health Promotion, Family Advocacy, and Operational Medicine. These studies provide large-scale survey data to address emergent issues and policy considerations identified by the Bureau of Medicine and Surgery, and the Bureau of Naval Personnel

1. Health Sciences Division (231). Performs research and development in areas such as Health and Physical Readiness, Alcohol Rehabilitation, Health Promotion, Family Advocacy, and Operational Medicine. These studies provide large-scale survey data to address emergent issues and policy considerations identified by the Bureau of Medicine and Surgery, and the Bureau of Naval Personnel.

2. Clinical Epidemiology Division (232). Exercises a broad range of epidemiologic research with a strong clinical component HTLV I and II. This division conducts interventional trials for the prevention of sexually transmitted diseases, musculoskeletal injuries, prophylactic agents, and vaccines.

3. Occupational Epidemiology & HIV Studies Division (233). Epidemiologic research focuses on human immunodeficiency virus (HIV) seroconversion, cancer, neurologic disorders, various other infectious and chronic diseases, and injuries which affect the health of active duty Navy and Marine Corps personnel. These studies integrate multiple large-scale data sources to describe in epidemiologic terms the distribution of these disorders and to identify their possible causes and associated factors, with the objective of providing information needed for effective strategies for prevention. This division also studies sub-populations with unique characteristics such as women serving aboard ships or in other deployed situations.

4. Gulf War Research Team (234). Exercises a broad range of epidemiologic research with a strong clinical component including studies of Gulf War Illnesses, respiratory diseases and resistant strains of common pathogens such as streptococcus.

**(b) Research program descriptions**

**New:**

DN240607 63706N M0095.001-6802

Suicide Risk and Adverse Psychological Response Assessment in the U.S. Navy (Hourani)  
Start: 10-1-97

DN240608 63706N M0095.001-6803

Operational Health Risk Reduction in Hospital-based Health Promotion Interventions  
(Trent) Start: 10-1-97

DN240611 63706N M0095.005-6811

Training Modifications to Prevent Stress Fractures in Female Marine Corps Recruits  
(Shaffer) Start: 10-1-97

**New (cont.)**

DN240597 DOD Reimbursable-6711

(short title): Global Surveillance for Infectious Diseases [DOD Surveillance Response System for Emerging Infectious Diseases: U.S. Navy Mode at Naval Health Research Center, San Diego] (Garland) Start: 5-6-97

DN240599 HQMC Reimbursable-6713

Intervention to Reduce Heavy Alcohol Use among Marine Corps Personnel (Shaffer) Start: 3-1-97

**Continuations:**

DN247503 M0106.001-6001

Navy Medical Support Capability (Nice) Start: 10-1-86

DN244622 (63738D P4464.001) NMRDC Reimbursable- 6423

Epidemiologic Studies of Morbidity Among Gulf War Veterans: A Search for Etiologic Agents and Risk Factors (Gray) Start: 4-1-94

**Study 1:** A Case-control Study of Symptoms Among 2250 Seabees

**Study 2:** A Comparative Study of Hospitalizations Among Active Duty Military Personnel who Participated in the Gulf War and Similar Military Personnel Who Did not Participate

**Study 3:** A Comparative study of Pregnancy Outcomes among Gulf War Veterans (Male and Female) and Other Active duty Personnel

**Study 4:** Reproductive Outcomes 7-12-95

**Study 5:** Seabee Health Study 1 Oct 95

**Study 6:** A Comparison of Federal and Nonfederal Hospitalization Rates among Veterans who have Separated from Active Service: Gulf War Veterans Versus Non-Gulf Veterans 8-1-95

**Study 7:** Prevalence of Congenital Anomalies among Children Born to Gulf War Veterans 8-1-95

DN241257 61102A M0101.BKX-6609

Epidemiological Studies of Emerging Illnesses Among U.S. Military Personnel (Gray) Start: 10-1-95

Study A. The Immunologic, Bacteriologic and Demographic Risk Factors for Invasive *Streptococcus pyogenes* Infections 10-1-95

Study B. Quality Assurance Test of New ELISA Reader using a Commercial Test for *Helicobacter pylori* 1-96

Study C: Triservice Surveillance for Antibiotic Resistance among *Streptococcus pneumoniae* Isolates Infecting U.S. Military Health Care Beneficiaries 7-97

Study E: Double-blind, Placebo controlled, clinical trial of Azithromycin as Prophylaxis against Bacterial Agents causing Acute Respiratory Disease among Military Trainees (Gray)

Study, Surveillance for Birth Defects among U.S. Naval Health Care Beneficiaries in San Diego County

DN241295 U Alabama (CRADA 96NMR444) Reimbursable-6615

Risk Factors for Chorioamnion Infection and Adverse Pregnancy Outcomes among active Duty Military Women and Dependent Women (Cassell/Gray/et al) Start: 6-1-96

DN240553 63706N M0095.008-6705

Musculoskeletal Injury Incidence and Physical Activity in Navy and Marine Corps Operational Personnel (Brodine) Start: 10-1-96

DN240558 63706N M0095.001-6706

Defense Medical Epidemiology Database Development (Garland) Start: 10-1-96

**Continuations (cont.)**

DN240554 63706N M0095.001-6707  
Health Readiness of Women and Men Aboard Navy Ships (Garland) Start: 10-1-96

DN240572 NEHC/BUMED Reimbursable-6709  
Tri-service Adenovirus Isolation and Typing Surveillance among High-risk Military  
Populations (Gray) Start: 10-1-96

DN240598 JHopkins CRADA-6712  
Structural Indices of Stress Fracture Susceptibility in Female Military Recruits (Shaffer)  
Start: 9-22-96

**Completions/terminations:**

DN241149 63706N M0095.008-6504  
Development and Validation of Predictive Models for Musculoskeletal Injuries in Navy  
and Marine Corps Populations (Shaffer) Start: 10-1-94 Comp: 9-30-97

DN241153 63706N M0095.005-6511  
Longitudinal Analysis of Lifestyle, Health, and Physical Readiness (Trent)  
Start: 10-1-94 Comp: 9-30-97

DN241253 MARCORSYSCOM Reimbursable-6516  
Marine Enhancement Program: Combat Boot Design (Brodine)  
Start: 3-1-95 Comp: 9-30-97

DN241291 Army Reimbursable-6614  
Defense Medical Epidemiology Database (Garland) Start: 3-12-96 Comp: 9-30-97

DN241296 MARCORSYSCOM Reimbursable-6616  
Physical Disability Severance Pay Separations Analysis (PDSEPS) (Garland)  
Start: 1-1-96 Comp: 9-30-97

DN241297 CNET Reimbursable-6617  
Development and Assessment of Training Models for the Prevention of Musculoskeletal  
Injuries in Navy Recruit Populations (Shaffer) Start: 1-1-96 Comp: 9-30-97

**(c) Significant accomplishments Jan-Dec 97**

(Jul) Dr. Frank Garland and CAPT Greg Gray attended the Global Surveillance and Response for Infectious Diseases Planning meeting at Walter Reed Army Institute of Research (WRAIR), Falls Church, VA. This initial planning meeting involved Navy representatives from NEHC and BUMED as well as representatives from other services and DOD Health Affairs.

(Jul) Dr. Frank Garland was designated the NHRC representative to the Joint Preventive Medicine Policy Group (JPMPG) Plenary Council for two years. Alternates are CAPT Stephanie Brodine, MC, USN and CAPT Gregory Gray, MC, USN

(Aug) Dr. Gray was on the Special Emphasis Panel to review and rate proposals to conduct studies of illnesses among Persian Gulf War Veterans. The panel met at the National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, GA on 12-13 Aug.

**(c) Significant accomplishments (cont.)**

(Aug) CAPT Gray, Clinical Epidemiology Division, attended the second meeting of the planning committee for the cooperative study on VA's "National Health Survey of Persian Gulf Veterans and Their Families," held 20 Aug 97 at Veterans Affairs Headquarters, Washington, DC.

(Aug) CAPT Gray attended the Armed Forces Epidemiological Board (AFEB) meeting at WRAIF, 21-22 Aug.

(Dec) CAPT Gray participated in the briefing of veterans' service organizations on Gulf War Illnesses for DOD Health Affairs in Washington, DC, 1-2 Dec.

**(d) Changes in departmental mission, functions, and resources.**

None

**(e) Major accomplishments**

CAPT Gray's 1997 briefings were as follows:

13 January, to General Accounting Team in San Diego;

29 January, to Persian Gulf Veterans Coordinating Board, Ft. Detrick, MD;

5 May, to Drs. Thomas and Hooper of USUHS in San Diego;

6 June, to Special Assistant for Gulf War Illnesses, DoD, in San Diego;

30 July to Interaency Persian Gulf War Coordinating Board, Research Working Group in Washington, DC.

**(f) Impact on Navy and Marine Corps mission.**

(Mar) LtGen Carol Mutter, USMC, met with the Clinical Epidemiology Division staff for two and a half hours discussing musculoskeletal injuries in recruits, alcohol abuse intervention for Marines aside from STDs and pregnancy in female Marines.

(May) CAPT Brodine and CDR Shaffer, Clinical Epidemiology Division, transitioned the HIV Intervention Program to the Marine Security Guard (MSG) Battalion in Quantico, VA. The transition consists of presentation of curriculum to the MSG staff and performing focus groups over a period of 3 days.

(Sep) CDR Shaffer, Clinical Epidemiology Division, travel from 4 to 22 Sep, include Washington, DC to brief HQMC on the status of the Alcohol Behavior Modification Study. From Washington, he will travel to Frankfurt and Bonn, Germany; Brussels, Belgium; Cairo, Egypt; and Abidjan, Ivory Coast to transition the STD Education Program to Marine Security Battalion (MSG) personnel. Visits will include site visits and briefing with embassies selected by the MSG Battalion. CAPT Brodine will join him from 9-22 Sep.

**(g) Technology transfer items of Interest.**

None reported.

**(h) Reports for 1997 include:**

(See 'Section 3, Supporting Documents' for list of 1997 Reports with Abstracts)

97-1 Brodine, SK & RA Shaffer. In: Chapter II, Preparation of Deploying Troops: The Role of Preventive Medicine Health Education (in press)

**(h) Reports for 1997 (cont.)**

- 97-7 Knoke, JD; GC Gray, & FC Garland (1998). Testicular Cancer and Persian Gulf War Service. Epidemiology, 9, 648-653. A376-344
- 97-13 Trent, L & SL Hurtado (1998)  
Longitudinal Trends and Gender Differences in Physical Fitness and Lifestyle Factors in Career U.S. Navy Personnel (1983-1994). Military Medicine, 163(3), 398-407 (A353-966)  
(1997 Center Publication, A328-021)
- 97-14 Shaffer, RA; SK Brodine, SI Ito, & AT Le (1999)  
Epidemiology of Illness and Injury among U.S. Navy and Marine Corps Female Training Populations. Military Medicine, 164(1), 17-21
- 97-15 Boyer, CB; MAB Shafer, RA Shaffer, SK Brodine, SI Ito, DL Yniquez, DM Benas, & J Schachter. STD/HIV Prevention in Young Military Men: Evaluation of a Cognitive-behavioral Skills-building Intervention
- 97-16 Nice, DS; RL Calderon, & SM Hilton. Reproductive Outcomes in the U. S. Navy: Experience of 33,130 Hospitalized Pregnancies during 1982-1992
- 97-18 Gray, CG; AW Hawksworth, TC Smith, HK Kang, JD Knoke, & GD Gackstetter (1998). Gulf War Veterans Health Registries. Army and National Guard Personnel Most Likely to Seek Evaluation . American Journal of Epidemiology, 148, 343-349. A3376-628
- 97-19 Gray, CG; KS Kaiser, AW Hawksworth, FW Hall, & E Barrett-Connor (1999). Increased Postwar Symptoms and Psychological Morbidity among U.S. Navy Gulf War Veterans.  
American Journal of Tropical Medicine & Hygiene, 60(5), 758-766. A376-510
- 97-20 Wingard, DL; D Kristz-Silverstein, & FC Garland. Gender Differences in the Association of Life Style Factors to the Prevalence and Symptoms of Migraines and other Headaches among Navy Personnel (Center Report, A378-282)
- 97-23 Hurtado, S; LK Trent, & SA Frack (1997). Relationships among Changes in Health Behavior in a Six-Year U.S. Navy Cohort. (Center Publication, A331-449)
- 97-24 Kritz-Silverstein, D; DL Wingard, & FC Garland. The Association of Life Style Factors with Menstrual Symptoms in Women Serving Aboard U.S. Navy Ships (Center Report, A378-279)
- 97-26 Brodine, SK; RA Shaffer, J Hagy & K Kaufman (1977). Biomechanical Properties of Infantry Combat Boot Development (Center Publication, A331-427)
- 97-29 Shaffer, RA; SK Brodine, SA Almeida, K Maxwell-Williams, & S Ronaghy  
The Use of Simple Measures to Physical Activity to Predict Stress Fractures in Young Men Undergoing a Rigorous Physical Training Program
- 97-30 Hourani, LL; G Warrack, & P Coben (1999). A Demographic Analysis of Suicide among U.S. Navy Personnel. Suicide and Life-threatening Behavior, 29(4), 365-375. A375-319  
(1997, Center Publication, A335-283)

**(h) Reports for 1997 (cont.)**

- 97-31 Almeida, SA; DW Trone, D Leone, RA Shaffer, S Patheal, & K Long. Gender differences in Musculoskeletal Injury Rates: A function of symptom reporting?
- 97-32 Hourani, LL; AG Warrack, & PA Coben (1999). Suicide in the U.S. Marine Corps, 1990-1996. Military Medicine, 164(8), 551-555. (1997, Center Publication, A335-281)
- 97-35 Gray, GC; TC Smith, JD Knoke, & JD Heller (1999). The Postwar Hospitalization Experience among Gulf War Veterans Possibly Exposed to Chemical Munitions Destruction at Khamisiyah, Iraq. American Journal of Epidemiology, 150(5), 532-540. A376-590
- 97-36 Kaufman, KR; SK Brodine, RA Shaffer, C Weech-Johnson, & T Cullison. The Relationship between Foot Morphology and Musculoskeletal Overuse Injuries
- 97-38 McDonough, C & GC Gray. Risk Factors for Sarcoidosis Hospitalization among U.S. Navy and Marine Corps Personnel, 1981-1995. Military Medicine (in press)
- 97-40 Hourani, LL & H Yuan (1999). The Mental Health Status of Women in the Navy and Marine Corps: Preliminary Findings from the Perceptions of Wellness and Readiness Assessment. Military Medicine, 164(3), 174-181  
  
Hourani, LL; H Yuan, W Graham, L Powers, C Simon-Arndt, & B Appleton (1998). The Mental Health Status of Women in the Navy and Marine Corps: Preliminary Findings from the 1995 Perceptions of Wellness and Readiness (POWR) Assessment (Center Publication, A339-334)
- 97-44 Dlugosz, L; WJ Hoyer, KS Kaiser, JD Knoke, JM Heller, NA Hamid, RJ Reed, KS Kendler & GC Gray (1999). Factors for Mental Disorder Hospitalization after the Persian Gulf War: U.S. Armed Forces, June 1, 1991-September 30, 1993. Journal of Clinical Epidemiology, 52(12), 1267-1278.

**Technical Documents:**

- 97-2B Almeida, SA; K Maxwell-Williams, RA Shaffer, JT Luz, EA Badong, & SK Brodine (1997). A Physical Training Program to Reduce Musculoskeletal Injuries in U.S. Marine Corps Recruits, User's Manual. (Center Publication, A326-216)
- 97-4D Garland, FC & S Tossey. Physical Disability Severance Pay Separations (PDSPS) Analysis Study

**3. SUPPORTING DOCUMENTS**

- Encl (1)     Scientific Technical Reports:
- a. List of 1997 Scientific Technical Reports and Publications with abstracts
  - b. Other Journal/Proceedings/Book Chapters published in 1997
  - c. Other Technical Reports published in 1997
  - d. Technical Documents published in 1997
  - e. Reports "in press"
- Encl (2)     Biography and Photo of Commanding Officer
- Encl (3)     \* Organization Chart as of 31 December 1997  
              \* Staff Directory  
              \* Boards, Committees, Collateral Duties
- Encl (4)     Presentations at Major Conferences
- Encl (5)     Honors, Awards for Civilian and Military Personnel
- Encl (6)     Logistic Support
- Encl (7)     Visitors
- Encl (8)     Miscellaneous
- \* Quarterly NHRC Updates: Jan (#4); Apr (#5); Jul (#6); Oct (#7)



### **3. Supporting Documents**

#### Scientific Technical Reports

- a. List of 1997 Scientific Technical Reports and Publications with Abstracts (pages 1-19)
- b. Other Journal/Proceedings/Book chapters published in 1997 (page 20 )
- c. Other Technical Reports Published in 1997 (page 21)
- d. Technical Reports Published in 1997 (page 22 )
- e. Reports "in press" (page 22)

### 3. Supporting Documents

#### a. Scientific and Technical Reports with abstracts; list of 1997

Report No. (Authors/Title/Publication Data/AD#, Work Unit number)

- 97-1 Brodine, SK & RA Shaffer .  
In: Chapter II, Preparation of Deploying Troops: The Role of Preventive Medicine Health Education (in press)  
Work Unit Number:

**Abstract:** None

- 97-2 Merrill, LL; CE Newell, LK Hervig, S Booth-Kewley, LA Patriarca, & PA Gilman  
Pre-enlistment Maltreatment Histories of U.S. Navy Basic Trainees: Prevalence rates for the 2<sup>nd</sup> quarter of 1994 and the 4<sup>th</sup> quarter of 1996  
(1997, Center Publication, A331-444)  
Work Unit Number: NAVPERS Reimbursable-6309

**Abstract:** Abusive victimization histories have shown to have a detrimental impact on general health, behavior, and interpersonal relations, which affect job performance, attrition, and naval readiness. This study surveyed U.S. Navy basic trainees for their pre-enlistment histories of abusive behaviors. Base rates found in the 4th quarter of 1994 were compared with the rates found in the 2nd quarter of 1996. The study results show that a relatively high number of both 1994 and 1996 basic trainees entered naval service with histories of (1) childhood physical abuse, (2) childhood sexual abuse, (3) adult physical and sexual victimization, (4) adult perpetration of physical and sexual aggression, (5) and alcohol misuse, which has been linked to the perpetration of aggressive behaviors, the vulnerability for victimization, and general negative behaviors. Without intervention and required treatment by health-care professionals, perpetrators of both sexual and physical aggression are at a high risk of repeating their behavior and at greater risk of adverse somatic and psychological consequences.

- 97-3 Galarneau, MR; KJ Mahoney, PJ Konoske, & KE Emens-Hesslink (1997)  
Development of a Model for Predicting Medical Supply Requirements at the Forward Echelons of Care: Preliminary Findings for Echelon II Lab and X-ray Ancillaries (Center Publication, A323-436)  
Work Unit Number: 63706N M0095.005-6510

**Abstract:** Reductions in worst-case scenario Marine Expeditionary Force casualty estimates and recent organizational changes in the structure of the medical battalion have contributed to the need to review the current Authorized Medical Allowance Lists (AMALs). This present study developed a model of the Echelon I and II supply stream that identified a clinical requirement for each item used to support forward medical care. Results of this study showed substantial reductions in the number of items required, weight and cubic feet of the proposed AMALs when compared to the current Marine Corps AMALs. This approach also produced an audit trail for each item that allows medical planners and logisticians to substantially improve the process of configuring the AMALs because only items that can be clinically related to a treatment task conducted in theater are considered for inclusion in the AMALs.

- 97-4 Merrill, L; CE Newell, JS Milner, LK Hervig, & SR Gold (1998)  
Prevalence of Premilitary Adult Sexual Victimization and Aggression in a Navy  
Recruit Sample Military Medicine , 163(4), 209-212  
Work Unit Number: NAVPERS Reimbursable-6309

Merrill, L; CE Newell, JS Milner, LK Hervig, & SR Gold (1997)  
Prevalence of Premilitary Adult Sexual Victimization and Aggression in a Navy  
Basic Trainee Sample (Center Publication, A331-445)

**Abstract:** This study surveyed a large sample of U.S. Navy basic trainees for their pre-enlistment histories of adult sexual assault. The objective was to establish base rates for adult sexual violence to guide the development of future studies and treatment, prevention, and education programs. The results show that 45.5% of the women reported being the victim of attempted (9.4%) or completed rape (36.1%) since the age of 14. A high percentage of recruits in this study reported histories of sexual assault. Female victims of sexual assault are at high risk of incurring somatic and/or psychological problems that require treatment by health-care professionals. Male perpetrators of sexual assault are at high risk of repeating their behavior. The results of this study suggest it may be cost-effective to develop treatment, education, and prevention programs for military recruits.

- 97-5 Merrill, LL; CE Newell, SR Gold, & JS Milner (1999)  
Childhood Abuse and Sexual Revictimization in a Female Navy Recruit  
Sample Journal of Traumatic Stress, 12, 211-225  
(1997 Center Publication, A331-433)  
Work Unit Number: NAVPERS Reimbursable-6309

**Abstract:** Women who were childhood victims of sexual abuse are at increased risk of sexual revictimization as an adult. A sample of female Navy recruits ( $n = 1,140$ ) were surveyed for pre-military histories of child abuse and adult rape. The results show that 55.4% of women who reported childhood sexual abuse reported subsequent rape, whereas 20.2% of the women who reported no childhood abuse reported rape. The highest rape rates were reported by women with a combined childhood history of physical and sexual abuse. Ethnic differences in reports of childhood abuse and rates of re-victimization were found. A regression analysis of the relative contributions of childhood sexual abuse, number of sex partners, and alcohol problems indicated childhood sexual abuse was the best predictor of adult rape.

- 97-6 Law, PG; HW Goforth Jr., SE Kaupp, WK Prusaczyk, K Schneider, & J Reid  
Efficacy of Downhill Running to Prepare Personnel for Mountain Hiking with  
Pack Weight (1997, Center Publication, A326-083)  
Work Unit Number: 62233N MM33P30.002-6412

**Abstract:** Unaccustomed eccentric exercise (e.g., hiking or running downhill) can result in muscle soreness (MS), strength loss, and muscle damage. The muscles may be prepared in advance by performing a similar eccentric activity. This study determined if downhill running could reduce adverse symptoms associated with a subsequent novel mountain hiking exercise. Special operation volunteers completed either treatment (DHR) or control (CRL) exercises. DHR performed two downhill runs, while CRL followed their normal training schedule. Two weeks after the second downhill run both groups completed two 6-mile mountain. Subjects in DHR did not exhibit significantly greater reductions in MS, creatine kinase, or in leg endurance

strength loss after either hike, nor a significant improvement in hiking performance compared to CRL. Under conditions of this study, downhill running did not provide significant protection against MS, muscle damage (CK), or short-term strength losses that accompany unaccustomed mountain hiking (with pack weight).

- 97-7 Knoke, JD; GC Gray, & FC Garland (1998)  
Lack of Association of Testicular Cancer and Persian Gulf War Service.  
Epidemiology, 9, 648-653 AD: A387344  
Work Unit Number: 63738D P4464.001-6423

**Abstract:** A study conducted to determine if regular active duty servicemen deployed to the Persian Gulf War (n = 513 413) were at increased risk of testicular cancer compared with non-deployed Gulf War era servicemen (n = 1 290 205). The Cox proportional hazards model for survival analysis with covariates was used to assess risk through 31 March 1996. For the 4.67 year period beginning 1 August 1991, race was a significant predictor of hospitalization for testicular cancer, age and occupation were of borderline significance, and deployment status was not significant. There was an increase in testicular cancer in the deployed group in the immediate postwar period, but by 4 years after the end of deployment the cumulative risks for the two groups were not different. Servicemen deployed to the Persian Gulf War were not at increased risk for testicular cancer compared with non-deployed era servicemen.

- 97-8 Puppione, DL; HW Goforth Jr., & SE Kaupp (1997)  
The Effect of Dietary Saturated Fat on the Production of Chylomicra  
Enriched in Saturated Fat (Center Publication, A326-213)  
Work Unit Number: 62233N MM33P30.002-6412

**Abstract:** In some mammals dietary saturated fats lead to the production of plasma chylomicra enriched in saturated triglycerides (TG). When these chylomicra are cooled to < 20 degrees C, *in vitro*, they form solid-phase TG cores that don't melt at physiological temperatures. Temperatures < 20 degrees C have been documented in human extremities during scuba diving. Chylomicra circulating in the extremities during cold exposure could form solid TG cores and subsequently impede blood flow to essential tissues (e.g., brain, cardiac and visceral). This study was to determine if this class of chylomicra could be produced in humans. Navy SEALs were fed a 1160 kcal breakfast containing 68 g of fat (40% saturated fat) and 600 mg cholesterol (CHOL). Postprandially, the TG:CHOL ratios were < 2.5; whereas ratios > 5.0 indicate the presence of the solid core chylomicra. Under the conditions of this study, the high melting point chylomicra do not occur in moderately endurance-trained humans after consuming a meal highly concentrated in saturated fats.

- 97-9 Cohen, BS; SJ Feith, & WK Prusaczyk (1997)  
The Effects of Wearing a Disposable Eye/Respiratory Protection (DERP) Mask  
in Environmental Extremes. (Center Publication, A327-982)  
Work Unit Number: USAF Reimbursable-6515

**Abstract:** The use of a Disposable Eye/Respiratory Protection (DERP) hood and mask was proposed to provide head, eye, neck, and respiratory protection on an emergency basis when normal protective equipment is not immediately available. This study evaluated three prototype DERP masks: Draeger, ILC, and MSA, under consideration for use by the U.S. Air

Force. Two subjects followed a 2-hr rest and exercise scenario in two environmental conditions, cold air (-29°C, 30% RH) and hot air (52°C, 30% RH) while wearing the three prototype masks. The CO<sub>2</sub> level and breathing resistance inside the Draeger and MSA masks were considered satisfactory, and unsatisfactory for ILC mask based on U.S. Air Force standards. Overall, the effects of wearing the masks on HR and body temperature, and subjective responses and feelings of exertion and comfort of the subjects were marginally satisfactory for the Draeger and unsatisfactory for the MSA and ILC.

97-10 Buono, MJ; JH Heaney, & MK Canine  
Acclimation to Humid Heat Lowers Resting Core Temperature  
Work Unit Number: 63706N M0096-002-6501

**Abstract:** The purpose of this study was to test the hypothesis that a reduction in resting rectal temperature (T<sub>re</sub>) is partially responsible for the attenuation in the rise of core temperature during the heat exposure following acclimation to humid heat. Nine male volunteers completed 7 days of acclimation, performing 2 h of exercise per day in a hot, humid environment (35 degrees C, 75% relative humidity). All nine men showed a decrease in resting T<sub>re</sub> from day 1 to day 7, ranging from -0.1 to -0.5 degrees C. In addition, resting T<sub>re</sub> and ending T<sub>re</sub> were significantly correlated (r = 0.68). However, the mean increases in T<sub>re</sub> (ending T<sub>re</sub> minus resting T<sub>re</sub>) and heat storage that occurred on each of the 7 acclimation days were not significantly different. These results support the hypothesis that a reduction in resting T<sub>re</sub> is partially responsible for the attenuation in ending T<sub>re</sub> during heat exposure following short-term acclimation to humid heat.

97-11 Hagan, RD; RD Bernhard, BS Cohen, JA Hodgdon (1997)  
Effect of Anti-exposure Suits on Body Temperatures during Shipboard  
Flooding Activities (Center Publication, A327-981)  
Work Unit Number: 63706N M0096-002-6415

**Abstract:** This study evaluated the effectiveness of a whole-body anti-exposure suit (AES) to maintain normal body temperatures during shipboard flooding repairs in cold water (9.6 degrees C). Recordings of rectal (T<sub>re</sub>), chest (T<sub>ch</sub>), arm (T<sub>ar</sub>), thigh (T<sub>th</sub>), calf (T<sub>ca</sub>), finger (T<sub>fi</sub>), and big toe (T<sub>to</sub>) temperatures were made in 8 males performing hull- and pipe-patching activities in a flooding simulator aboard the Ex-USS SHADWELL (LSD-15). A total of 15 tests were conducted over 4 days with subjects wearing coveralls, which represented the control (CON) condition or the Naval Clothing and Textile (NAVCLCLO) AES. T<sub>re</sub> remained constant; however, cold-water exposure was associated with decreases in T<sub>ch</sub>, T<sub>ar</sub>, T<sub>fi</sub>, T<sub>th</sub>, T<sub>ca</sub>, and T<sub>to</sub> for both CON and NAVCLCLO. Comparison of end-of-exposure responses revealed significantly higher T<sub>ch</sub>, T<sub>ar</sub>, T<sub>th</sub>, T<sub>ca</sub>, and T<sub>to</sub> for NAVCLCLO compared with CON. In conclusion, NAVCLCLO provided protection against decreases in body temperatures during short-term immersion in cold water during pipe- and hull-patching activities.

97-12 Schallhorn, S; CL Blanton, JL Reid, SE Kauppp, L Zoback, CW Flowers &  
PJ McDonnell. Topographic Detection of Photorefractive Keratectomy  
Ophthalmology, 1998, 105(3), 507-516 A375-320  
Work Unit Number: 60407N 407BB.002-6419

**Abstract:** This study aimed to evaluate the sensitivity and specificity of subjective review of corneal topography to detect patients who have undergone photorefractive keratectomy (PRK). Topographic maps from 3 different devices were obtained from 19 patients with postoperative

PRK and 9 control subjects with emmetropia and 10 control subjects with myopia. Fifteen masked reviewers independently rated each map as either postoperative PRK or not. The overall sensitivity (ability to detect PRK) and specificity rates (ability to exclude control subjects) by reviewers were 65% and 93%, respectively. Several control topography patterns (e.g., homogeneous, focal, and keyhole) were disproportionately more difficult to correctly identify on the Eyesys device. If subjective review of topography is used as the only method of detection, many patients with PRK will not be identified properly. In addition, the most prevalent preoperative myopic category in the general population (myopia < -3.00 D) also is the most difficult to detect after treatment. This reduces the usefulness of topography as a screening tool. Other techniques are needed to improve the detection of patients with postoperative PRK..

- 97-13 Trent, L & SL Hurtado (1998)  
 Longitudinal Trends and Gender Differences in Physical Fitness and Lifestyle  
 Factors in Career U.S. Navy Personnel (1983-1994)  
Military Medicine, 163(3), 398-407 (AD# A353-966)  
 Work Unit Number: 63706N M0096.002-6511

Trent, L & SL Hurtado (1997)  
 Longitudinal Trends and Gender Differences in Physical Fitness and Lifestyle  
 Factors in the U.S. Navy (1983-1994) (Center Publication, A328-021)

**Abstract:** This study examines long-term health and physical readiness trends in the U.S. Navy. Lifestyle questionnaires were mailed to all participants from baseline studies between 1983 and 1989 who were still on active duty in 1994. Commands provided body composition and Physical Readiness Test (PRT) scores for the participants. Two longitudinal cohorts were created: an 8-year sample (N=640) with matched data from 1986, 1989 and 1994; and an 11-year sample (N=1,576), with data from 1983 and 1994. Analysis from both cohorts revealed significant improvements in physical fitness, exercise, lean body mass, dietary habits, and sleep, as well as significant decreases in tobacco and alcohol use, and job stress. However, hyper-tension rates, percent body fat, and body mass index showed significant increases over time. Women's scores were significantly better than men's on a number of factors. Overall, these significant findings suggest that the Navy's health promotion efforts have had a significant positive impact on the health and fitness of career Navy personnel.

- 97-14 Shaffer, RA; SK Brodine, SI Ito, & AT Le (1999)  
 The Epidemiology of Illness and Injury among Select U.S. Navy and Marine  
 Corps Female Training Populations  
Military Medicine, 164,(1), 17-21  
 Work Unit Number: Army Reimbursable-6610

**Abstract:** Evidence suggests that female military populations are at greater risk than their male counterparts for certain training and combat-related illnesses and injuries. This prospective, multi-site, epidemiological study defined the patterns of illness and injury in military women during training. A computer-based outpatient tracking system was developed for prospective data collection of all outpatient encounters for use at 1) Officer Candidate School (OCS), Quantico (U.S. Marine Corps [USMC] female officers); 2) Marine Corps Recruit Depot (MCRD), Parris Island (USMC enlisted women); and 3) Recruit Training Center (RTC), Great Lakes (U.S. Navy enlisted women). During the study period, the majority of women in each of the sites had at least one medical encounter during training. The most common category of medical encounters at all three sites was musculoskeletal injury, followed by respiratory and dermatologic disorders. This study establishes high morbidity rates and

identifies medical priorities for preventive interventions in Marine Corps and Navy female trainees.

- 97-15 Boyer, CB; MAB Shafer, RA Shaffer, SK Brodine, SI Ito, DL Yniquez, DM Benas, & J Schachter  
STD/HIV Prevention in Young Military Men: Evaluation of a Cognitive-behavioral Skills-building Intervention  
Work Unit Number: 63105A 00101.KHX-6406

**Abstract:** To evaluate the efficacy of a cognitive-behavioral, skills-building intervention to prevent sexually transmitted diseases (STDs), including the human immunodeficiency virus (HIV) in junior, enlisted Marines on a 6-month deployment to the Western Pacific aboard ships with periodic visits to foreign ports (liberty). Subjects were 565 men who participated in a 4-session, multi-component, cognitive-behavioral intervention or received cardiopulmonary resuscitation training. Based on the Information, Motivation, and Behavioral skills model, the primary goals were to increase knowledge, reduce high-risk psychosocial (motivation) factors, and build skills. The outcomes of interest were acquisition of STDs, alcohol abuse and sexual risk behaviors during liberty ports of call. The intervention significantly decreased self-reports of alcohol abuse and sexual risk, and it increased knowledge regarding STD/HIV symptoms and treatment. However, the intervention did not clearly or consistently enhance STD/HIV-related motivation factors and behavioral skills.

The impact of the intervention on STDs could not be evaluated due to universal antibiotic prophylaxis required for malaria after a change of deployment venue. The results suggest that a cognitive-behavioral, skills-building intervention consisting of multiple sessions can be implemented and evaluated in military personnel in deployed settings. The results have important implications for implementation of such interventions in other nonclinical settings.

- 97-16 Nice, DS; RL Calderon, & SM Hilton  
Reproductive Outcomes in the U. S. Navy: Experience of 33,130 Hospitalized Pregnancies during 1982-1992  
Work Unit Number: 65162N M0106.001-6001

**Abstract:** The study determined the rate of hospitalized adverse pregnancy outcomes in the U.S. Navy and examined their demographic and occupational correlates utilizing all 37 U.S. Navy hospitals worldwide. Participants were a population-based sample of 25,763 U.S. Navy enlisted women hospitalized for 33,130 pregnancy-related outcomes between 1982 and 1992. The results showed the distribution of reproductive outcomes was 86% live births, 2.7% ectopic pregnancies, 7.3% spontaneous abortions, 3.3% other early fetal deaths, and .8% late fetal deaths. Women who were older than 30 years of age, were Black, were in the lowest pay grade, or did not have an occupational specialty were at significantly greater risk for a number of different adverse pregnancy outcomes.

In conclusion, Navy women are at increased risk for ectopic pregnancy, particularly very junior women and Black women. Results suggest that occupational exposure among junior women and women who have not yet attained an occupational specialty may be associated with adverse reproductive outcomes among Navy women.

- 97-17 Canine, MK; B Bothorel, C Habib, DW Trone, G Vurbeff, & RS Pozos (1997)  
Thermoregulatory Consequences of Upper Body versus Lower Body Exercise  
(Center Publication, A328-063)  
Work Unit Number: 62233N MM33P30.007-6207

**Abstract:** This study examined the effects of exercise mode on heat strain when cooling was provided by liquid-based microclimate cooling. Eight males exercised 20 min every half-hour for a total of 120 min in a hot environment while dressed in a chemical protective over-garment. Subjects complete four tests: upper body exercise (UBE) with no cooling (NC), UBE with cooling (C), lower body exercise (LBE) with NC, and LBE with C. Heat strain indices were similar between LBE and UBE when no cooling was provided. When cooling was provided, sweat rate and rectal temperature were similar between exercise modes, but HR was significantly higher during UBE-C than during LBE-C. Heat transfer to the cooling system was greater during LBE than during UBE, possibly due to the lower efficiency in performance of LBE. Thus, whole body heat transfer under these conditions may be related to metabolic heat production rather than to region of muscular activity.

97-18 Gray, CG; AW Hawksworth, TC Smith, HK Kang, JD Knoke, & GD Gackstetter (1998)  
Gulf War Veterans Health Registries. Who is Most Likely to Seek Evaluation  
American Journal of Epidemiology, 148(4) 343-349 A376-628  
Work Unit Number: 63738D P4464.001-6423

**Abstract:** Using Department of Defense hospital data, we examined the postwar hospitalization experience from March 1991 through September 1995 of US Gulf War veterans who were near Khamisiyah, Iraq, during nerve agent munition destruction in March 1991.

Multiple sources of meteorological, munition, and toxicology data were used to circumscribe geographical areas of low level, vaporized nerve agent for four days after the destruction. Plume estimates were overlaid on military unit positions and exposure was estimated for the 349,291 US Army Gulf War veterans. Exposure was classified as not exposed (n=224,804), uncertain low dose exposure (n=75,717) and specific estimated subclinical exposure (n=48,770) categorized into 3 groups for dose-response evaluation. Using Cox proportional hazard modeling, the postwar experiences of these exposure groups were compared for hospitalization due to any cause, for diagnoses in 15 unique categories, and for specific diagnoses an expert panel proposed as most likely to reflect latent disease from such subclinical exposure.

There was little evidence that veterans possibly exposed to the nerve agent plumes experienced unusual postwar morbidity. While there were several differences in hospitalization risk, none of the models suggested a dose-response relationship or neurological sequelae. These data, having a number of limitations, do not support the hypothesis that Gulf War veterans are suffering postwar morbidity from subclinical nerve agent exposure.

97-19 Gray, CG; KS Kaiser, AW Hawksworth, FW Hall, & E Barrett-Connor (1990).  
Increased Postwar Symptoms and Psychological Morbidity among U.S. Navy  
Gulf War Veterans A376-510  
American Journal of Tropical Medicine & Hygiene, 60(5), 758-766  
Work Unit Number: 63738D P4464.001-6423

**Abstract:** To investigate reports on war-related morbidity, 527 active-duty Gulf War veterans and 970 nondeployed veterans from 14 Seabee commands were studied in 1994 with a questionnaire, sera collection, handgrip strength, and pulmonary function testing. The questionnaire assessed postwar symptoms, war exposures, and screened for chronic fatigue syndrome, posttraumatic stress disorder, and psychological symptoms suggesting neurosis (Hopkins Symptom Checklist). Sera were tested with 4 nonspecific reactant assays: C-reactive protein, transferrin, ferritin, and haptoglobin.



Gulf War veterans reported a higher prevalence for 35 of 41 symptoms, scored higher on psychological symptom scales, were more likely to screen for posttraumatic stress disorder, had lower handgrip strength, and higher serum ferritin assay results. Numerous comparisons of these morbidity outcomes with 30 self-reported exposures demonstrated many associations, but no unique exposure or group of exposures were implicated. Morbidity data are consistent with other postwar observations, but the etiology for morbidity findings remains uncertain.

- 97-20 Wingard, DL; D Kristz-Silverstein, & FC Garland  
Gender Differences in the Association of Life Style Factors to the Prevalence  
and Symptoms of Migraines and other Headaches among Navy Personnel  
(1999 Center Report, A388-282)  
Work Unit Number: Army Reimbursable-6611

**Abstract:** Migraine is a serious and painful disorder characterized by severe headaches that often are associated with sensitivity to light and noise, visual disturbances, and nausea. Few previous studies have examined the association between life-style characteristics and prevalence of migraines and their symptoms.

A cross-sectional study questionnaire-based survey was performed of 2,914 women crew members and a matched comparison group of 2,841 men assigned aboard 36 U.S. Navy ships during 1994-1996. The men were matched to the women on ship, work division, department, race, pay grade group, rating, and date of birth ( $\pm 2$  years). The overall median ship response rate for 36 ships was 63.1 % and the overall mean response rate was 52.2%. The overall median response rate for women was 66.2%.

Cigarette smoking was positively associated with migraines in both genders. There was no consistent association of usual alcohol intake, exercise, or obesity with migraines. Sleeping seven or more hours per 24-hour interval was associated with a lower rate of migraine symptoms in both genders. Prevalence rates of migraines are high and possibly could be reduced by reduction in cigarette smoking rates

- 97-21 Booth-Kewley, S & K Freeman (1997)  
Enhancing Medical Care: The Computerized Critical Incident Technique  
(CCIT) Survey (Center Publication, A331-452)  
Work Unit Number: 63706N M0095.001-6427

**Abstract:** Iatrogenic illness and injury are a major source of morbidity and mortality for hospitalized patients. This project developed a survey that could be used to obtain systematic information about adverse medical events. The critical incident technique was used to develop the Computerized Critical Incident Technique (CCIT) Survey. The survey system was positively received by the staff and the reports resulted in a number of corrective actions. The survey was revised to correct several problems. The second version of the survey (CCIT-II) was evaluated by subject matter experts and their feedback provided was used as the basis for a second revision. This resulted in the third, current version of the survey (CCIT-III).

- 97-22 Canine, MK, CM Habib, R Bernard, A Ashinger, GK Vurbeff, RS Pozos, & JA  
Hodgdon (1997)  
The Effect of Perfusate Temperature in a Liquid Cooling System on Heat  
Strain and Heat Transfer (Center Publication, A335-481)  
Work Unit Number: 62233N MM33P30.007-6207

**Abstract:** Decreasing perfusate temperature (Tp) in a liquid cooling system (LCS) leads to a proportional increase in heat transfer (Q) when measured on a mannikin. However, it is uncertain if the linear relationship between Tp and Q holds when cooling is applied to humans. This study was to determine the effectiveness of three different Tp to reduce heat strain in personnel required to walk on a treadmill (3 miles.hr-1 at 2% grade) for 60 min in a hot-humid environment (35oC) and 65% relative humidity). Indices of heat strain and Q were measured in 12 subjects during one control condition (no cooling [NC]) and three experimental conditions with Tp of either 10oC (10C), 20oC (20C), or 30oC (30C). In this study, 10C and 20C significantly reduced heat strain when compared with 30C and NC. However, 10C did not significantly reduce heat strain further when compared with 20C.

97-23 Hurtado, S; LK Trent, & SA Frack (1997)  
Relationships among Changes in Health Behavior in a Six-Year U.S. Navy Cohort (Center Publication, A331-449)  
Work Unit Number: 63706N M0095.005-6511

**Abstract:** The importance of health behaviors in preventing disease and protecting or promoting health has been well demonstrated, however, the relationship between health behaviors is not clearly understood. Understanding how specific health behaviors are associated with other health behaviors may have implications for designing effective health promotion programs and to understand the underlying motivations to practice healthy behaviors in general. Researchers have reported the interrelationships among health behaviors using cross-sectional data. The present study utilized longitudinal data to examine the relationships among changes in five key lifestyle behaviors among a 6-year cohort of U.S. Navy personnel. Participants were 1,019 active-duty U.S. Navy personnel who completed a health behavior and lifestyle questionnaire in 1988 and 1994. There were several significant, weak correlations among exercise, diet, alcohol use, cigarette use, and sleep; regression analyses indicated change in dietary behavior was related to change in exercise activity; and, a lesser extent, in alcohol use. A change in cigarette use was related to changes in the number of hours of nightly sleep and in alcohol use. The variance accounted for in each change relationship was small. The results suggest there is very little overlap among changes in health behaviors examined in this study and that health promotion interventions should be behavior-specific.

97-24 Kritz-Silverstein, D; DL Wingard, & FC Garland  
The Association of Life Style Factors with Menstrual Symptoms in Women Serving Aboard U.S. Navy Ships (1999 Center Report, A378-279)  
Work Unit Numbers: 62233N MM33P30.002-6411 & 63706N M0095.001-6707

**Abstract:** It is estimated that 50-85% of women in the United States currently having menstrual periods experience dysmenorrhea and other menstrual or pre-menstrual symptoms, and that 3.5-7 million are incapacitated for one to two days each month. Previous studies examining the association of behavioral and life style factors such as obesity, cigarette smoking, alcohol consumption and exercise with menstrual symptoms have yielded inconsistent results; some show a positive association, others either no association or a negative association. Previous studies of the association of life style variables with menstrual disorders have relied on small clinic- or physician-based samples of women, or small samples of college students. There have been relatively few large, population-based studies of the association of behavioral and life style variables with dysmenorrhea or other menstrual symptoms.

A cross-sectional questionnaire based survey of 2,912 women serving aboard 36 U.S. Navy ships, was conducted. The association of body mass index, cigarette smoking, alcohol consumption and exercise with the prevalence of menstrual cycle disorders was studied. After adjustment for age and other potentially confounding covariates, current cigarette smoking was associated with increased risk of all menstrual symptoms and cycle disorders while obesity, exercise and alcohol consumption showed no consistent associations with menstrual symptoms or cycle disorders. Results suggested that smoking cessation might be useful to reduce the prevalence of menstrual symptoms, cycle disorders and time lost from work.

- 97-25 Burr, RG; LL Merrill, & K Emens-Hesslink (1997)  
U.S. Navy Women's Satisfaction with Obstetric and Gynecologic Medical Care  
(Center Publication, A331-426)  
Work Unit Number: BUPERS Reimbursable-6309

**Abstract:** Obstetric and gynecologic (OB/GYN) services are among the most frequent reasons why women utilize health care. The present study assessed U.S. Navy women's perceptions of the quality of OB/GYN medical care provided by the Navy. U.S. Navy women who completed the survey were satisfied with both OB and GYN medical care. More than 80% reported that the Navy's OB/GYN health care program met most or almost all of their needs. Female personnel who were older, who had more years of military service, who were of higher rank, and who were married reported the highest levels of satisfaction with OB/GYN medical care. The higher levels of OB/GYN medical care satisfaction these Navy women reported may be due to greater organizational commitment among more experienced personnel.

- 97-26 Brodine, SK; RA Shaffer, J Hagy, & K Kaufman (1977)  
Biomechanical Properties of Infantry Combat Boot Development.  
(Center Publication, A331-427)  
Work Unit Number: MARCORSYSCOM Reimbursable-6516

**Abstract:** A critical item of U.S. Marine Corps standard military issue is the combat boot. Military requirements demand a boot that is comfortable, durable, and enhances the movement capabilities of the soldier. This study evaluated the biomechanical properties of current commercially available boots and provided recommendations for a combat boot with optimal design. The evaluation included physical tests of the cushioning and material characteristics of military and commercial footwear, and biomechanical tests using human subjects. A survey addressing comfort parameters was administered to each subject. Boot impact tests revealed that all of the commercially available boots tested superior to the standard-issue jungle and leather combat boots. According to the subject performance tests, the greatest shock absorption and lowest power requirements were obtained with the Asolo 540 boot, the Bates Lite 924 boot, and the polyurethane prototype boot. The greatest stability was achieved with the Danner Acadia boot, the leather combat boot, and the Bates Lite boot. The jungle boot improved markedly in each of the subject test parameters with the addition of the polyurethane sole (polyurethane prototype boot). Findings suggest that currently commercially available boots offer superior features over the standard-issue military boots. This study illustrates that several optimal characteristics from various commercially available boots can be combined to create a military prototype boot which surpasses that which is currently in use.

- 97-27 Gauker, ED & R Reed (1997)  
Medical Diagnosis in Operations Other Than War (OOTW): Relationship to  
DEPMEDS Patient Conditions (Center Publication, A331-438)  
Work Unit Number: 63706N M0095.005-6510

**Abstract:** Due to an upward trend in operations other than war (OOTW), such as peace-keeping and humanitarian missions, medical practitioners may encounter injuries and diseases that differ from those typically seen in combat operations. Outpatient diagnoses, collected from a triservice field hospital in Zagreb, Croatia during a multinational peacekeeping mission, were mapped to corresponding DEPMEDS patient condition (PC) codes. Diagnoses that did not map to PC codes were examined to determine how to expand DEPMEDS to account for them in the planning process. Approximately 62% of the diagnoses (n=3593) mapped to an existing DEPMEDS PC. Respiratory diseases mapped most often, with only 25 of 1095 occurrences (2.28%) remaining unmatched. Injury was the largest category, both in frequency (n=1916) and in number and proportion (n=665, 30.04%) of unmatched cases. Among other classifications, more than 50% of musculoskeletal, circulatory, genitourinary, gastrointestinal, and infectious disorders were unmapped.

97-28 Galarneau, MR; PJ Konoske, KE Emens-Hesslink, G Pang, & ED Gauker  
A Model for Predicting Medical Supply Requirements at the Forward Areas of  
Care: Battalion Aid Stations  
(1997, Center Publication, A331-422)  
Work Unit Number: 63706N M0095.005-6510

**Abstract:** The objective of the current study was to develop a model (of the echelon 1a [battlefield] and echelon 1b [Battalion Aid Station] medical supply stream) that established clinical requirements by linking each supply item to the specific medical task and type of patient condition (PC) requiring the item. A list of specific medical supply items required for the BAS Authorized Medical Allowance Lists (AMALs) was produced by loading information into a patient generating model. When compared to the current Marine Corps BAS AMALs, the proposed AMALs resulted in reductions of 33% in weight and 55% in cubic volume for the equipment AMAL 635 and 29% reductions in weight and 30% in cubic volume for the consumable AMAL 636. This approach, which resulted in no reductions in BAS clinical capability, produced an audit trail for each item that allows medical planners and logisticians to substantially improve the process of configuring the AMALs because only items that can be clinically related to a treatment task conducted in theater are considered for inclusion in the AMALs.

97-29 Shaffer, RA; SK Brodine, SA Almeida, K Maxwell-Williams, & S Ronaghy  
The Use of Simple Measures to Physical Activity to Predict Stress Fractures in  
Young Men Undergoing a Rigorous Physical Training Program  
Work Unit Number: 63706N M0095.008-6504

**Abstract:** This study was to develop, test and refine a screening tool to identify those individuals at high risk for lower extremity stress fracture when beginning a rigorous physical training program. Two separate cohorts of 17 to 28 year old, male U.S. Marine Corps recruits were followed to develop, then test and refine, an algorithm that assigned individuals to either a "high" or "low" risk category of stress fracture susceptibility at the beginning of training. The algorithm was based on five self-report questionnaire items about recent physical activity and the time on a 1.5 mile field fitness test. Our data suggest that the risk of lower extremity stress fracture during rigorous physical training is increased by poor physical fitness and low levels of physical activity prior to beginning the program.

- 97-30 Hourani, LL; G Warrack, & P Coben (1997)  
A Demographic Analysis of Suicide among U.S. Navy Personnel  
Suicide and Life threatening Behavior, 29(4), 365-375 A375-319  
(1997 Center Publication, A335-283)  
Work Unit Number: 65152N M0106.001-6001

**Abstract:** This study examined the extent to which suicide in U.S. Navy populations differed relative to comparable civilian populations and addressed the following three research questions: 1) Are Navy active-duty personnel at higher risk for completed suicide than their employed civilian counterparts? 2) Relative to employed civilians, what are the highest risk demographic groups? And, 3) What are the trends in rates over time and space (e.g., clustering effects) and how do they compare with civilian trends? Age-, sex-, race-, and employment-adjusted rates were calculated for sailors committing suicide between 1990 and 1996 and compared with adjusted rates for civilians calculated from national mortality records. Cluster analyses were conducted on annual rates from 1983 through 1995 to examine differences between comparison groups across time and location. Results showed fewer than expected suicides for Caucasian and African American males and a somewhat higher than expected suicide rate among other ethnic group males and among Caucasian women. The suicide rate appears to be increasing in recent years, with some evidence toward a clustering effect in time and space.

- 97-31 Almeida, SA; DW Trone, D Leone, RA Shaffer, S Patheal, & K Long  
Gender differences in Musculoskeletal Injury Rates: A function of symptom reporting?  
Work Unit Number: 63706N M0095.008-6504  
Work Unit Number: Army Reimbursable-6436

**Abstract:** This study determined gender differences in voluntary reporting of lower extremity musculoskeletal injuries among U.S. Marine Corps (USMC) recruits, and it examined the association between these differences and the higher injury rates typically found among women trainees. Subjects were 176 males and 241 female enlisted USMC recruits who were followed prospectively through 11 weeks (men) and 12 weeks (women) of boot camp training. Reported injuries were measured by medical record reviews. Unreported injuries were determined by a questionnaire and medical examination administered at completion of training. Among female recruits, the injuries most commonly reported were patellofemoral syndrome, ankle sprain, and iliotibial band syndrome; the most common unreported injuries were patellofemoral syndrome, metatarsalgia, and unspecified knee pain. Among male recruits, the most frequently reported injuries were iliotibial band syndrome, ankle sprain, and Achilles tendinitis/bursitis; most commonly unreported diagnoses were the shin splints, iliotibial band syndrome, and ankle sprain. This study showed that female USMC recruits were significantly more likely to voluntarily report a musculoskeletal injury than were male recruits. When unreported injuries were measured, the increased injury risk among female recruits disappeared.

- 97-32 Hourani, LL; AG Warrack, & PA Coben (1999)  
Suicide in the U.S. Marine Corps, 1990-1996  
Military Medicine, 164(9\*), 551-555  
(1997 Center Publication, A335-281)  
Work Unit Number: 65152N M0106.001-6001

**Abstract:** Epidemiologic studies of suicide in the military have not controlled for the higher suicide rates of the unemployed expected in comparative national populations. This study

compared the observed number of suicides among U.S. Marine Corps personnel during 1990 to 1996 with the expected number based on rates for the employed general U.S. population. Standardized mortality ratios were calculated to identify demographic groups with higher or lower than expected numbers of suicides. The scan statistic and the Knox technique were used to evaluate potential suicide cluster patterns. Overall, the number of suicides in the Marine Corps ( $n = 213$ ) were fewer than the expected number ( $n = 225$ ). Hispanic and other ethnic group males and women Marines had greater than expected numbers. Evidence for suicide clustering in time and space was equivocal.

- 97-33 Vickers, RR Jr.; LK Hervig, & MR White (1999)  
 Job Demands and Back Injury in Navy Personnel  
 (Center Publication, A370-142)  
 Work Unit Number: 63706N M0096.002-6716  
 Work Unit Number: 63706N M0096.005-6512

**Abstract:** Department of Defense physical fitness guidelines call for occupation-specific fitness standards for exceptionally demanding occupations. This study examined the relationship between physical demand ratings (PDRs) and back injury hospitalization rates (BIRs) for 73 entry-level U.S. Navy occupations. The study demonstrated a strong relationship between PDRs and BIRs ( $r = .59$ ), which increased substantially when two outlier occupations were dropped from the analysis ( $r = .72$ ). A further increase in the strength of association was noted when a quadratic function was used rather than a linear function ( $r = .74$ ). Applying the quadratic function, any occupation with a rating of 2.93 or higher had a predicted BIR significantly higher than the predicted BIR for a minimally demanding job. Using this criterion to define an exceptionally demanding job, 44% of the 73 occupations studied would require occupation-specific fitness standards.

- 97-34 Vickers, RR Jr.; LK Hervig, E Walton, R Kanfer, & PL Ackerman  
 Personality Change during Military Basic Training  
 Work Unit Number: ONR Reimbursable-6252

**Abstract:** Military basic training is a stressful situation that may influence the personality development of military recruits. Training personnel perceive substantial positive changes in recruits, but the limited empirical evidence suggests that training increases mild symptoms of psychopathology. This study utilized a combination of between-groups and within-subjects research designs to demonstrate that neuroticism decreased and conscientiousness increased during basic training. Extraversion, openness, and agreeableness were not affected by basic training. These findings support the view of training personnel that basic training fosters positive changes. Combined with the results of recent meta-analyses of personality and job performance, the results indicate that basic training graduates are better prepared psychologically to be effective service members than they were when they entered the service.

- 97-35 Gray, GC; TC Smith, JD Knoke, & JD Heller (1999) A376-590  
 The Postwar Hospitalization Experience among Gulf War Veterans Possibly  
 Exposed to Chemical Munitions Destruction at Khamisiyah, Iraq  
American Journal of Epidemiology, 150(5), 532-540  
 Work Unit Number: 63738D P4464.001-6423

**Abstract:** Veterans groups and scientific expert panels are concerned that Gulf War (GW) veterans may be experiencing postwar illnesses due to subclinical wartime nerve agent exposure. Using data from deployed military units, meteorological sources, and munition

modeling estimates, gas plumes were estimated about March 10, 1991 destruction of a large cache of chemical weapons at Khamisiyah, Iraq. These plumes were used to identify veterans possibly exposed to subclinical aerosolized microconcentrations of nerve agent. Using Cox proportional hazard modeling, the postwar hospitalization experience (57 months) of 61,640 possibly exposed veterans was compared to that of 242,426 other Army GW veterans. Modeling outcomes included hospitalization for "any cause," for diagnoses in 16 unique categories, and for specific diagnoses an expert panel proposed as most likely to reflect latent disease from such subclinical exposure. None of the 24 multivariate models for broad or specific hospitalization outcomes demonstrated an increased risk among possibly exposed veterans. These data do not support the hypothesis that GW veterans who were near the March 1991 chemical munition demolitions at Khamisiyah, Iraq are experiencing an increase in postwar morbidity severe enough to merit hospitalization.

- 97-36 Kaufman, KR; SK Brodine, RA Shaffer, C Weech-Johnson, & T Cullison  
The Relationship between Foot Morphology and Musculoskeletal Overuse  
Injuries  
Work Unit Number: 63706N M0095.008-6302

**Abstract:** None

- 97-37 Reading, JE; DE Roberts & WK Prusaczyk (1998).  
Gender Differences in Finger Temperatures during Cold Air Exposure  
(Center Publication, A359-127))  
Work Unit Number: 63706N M0096.002-6603

**Abstract:** Exposure of the fingers to cold air during work and exercise can lead to a decrement in function and increase the risk for cold injury. The ability of women to resist these effects during cold exposure is unknown. The purpose of this study was to compare finger temperatures of women and men exposed to 0°C air for up to 135 min (15 min with mittens on, and up to 120 min with mittens off). Active-duty U.S. Navy personnel (nine women and nine men) wore warm winter clothing during each trial, sat with their arms supported at heart level, hands laying on an open mesh surface. Due to removal of subjects before 135 min, analyses were performed on only the first 75 min of cold air exposure. In all  $T_f$ , men were significantly warmer ( $p < 0.05$ ) than women between minute 0 and minute 40. Our findings suggest that short-term exposure to cold may place women at a greater risk for cold injury to the fingers than men.

- 97-38 McDonough, C & GC Gray  
Risk Factors for Sarcoidosis Hospitalization among U.S. Navy and Marine  
Corps Personnel, 1981-1995  
Military Medicine (in press)  
Work Unit Number: 61102A M0101.BKX-6609

**Abstract:** Sarcoidosis has been attributed to various demographic risk factors, yet findings may be falsely elevated by effects such as socioeconomic status. We used univariate and multiple logistic regression to compare demographic data from military sarcoidosis hospitalizations with similar data from the US Navy and Marine Corps populations from 1981-1995. A total of 626 first hospitalizations for sarcoidosis were identified (median age, 28 years). After adjusting for pay grade, blacks, compared with whites, had sevenfold increased odds of

sarcoidosis hospitalization. Risk increased with age, the oldest age group having 5 times the odds of the youngest age group. A home of record in the southeast United States was associated with increased risk. Multivariate modeling permitted us to determine independent risk factors for sarcoidosis hospitalization, in contrast to previous studies which have focused mainly on unadjusted rates. These findings are useful in identifying populations at high risk for sarcoidosis.

- 97-39 Blood, CG; JM Zouris & D Rotblatt (1998)  
Using the Ground Forces Casualty Forecasting System (FORECAS) to Project  
Casualty Sustainment  
(Center Publication, A339-487)  
Work Unit Number: 63706N M0095.005-6704

**Abstract:** The FORECAS planning tool was designed to assist medical requirements specialists in determining the resource needs of specific ground combat operations. The FORECAS tool provides projections of wounded-in-action, killed-in-action, and disease/nonbattle injury incidence for infantry, support, and service support troops under various combat conditions. FORECAS was constructed in two phases: development of a simulation tool that reflects the statistical trends observed in previous combat scenario, and assessment and quantification of the adjustments necessary to enable FORECAS projections to reflect contemporary scenarios. The FORECAS simulations were found to represent the trends observed in the historical data.

- 97-40 Hourani, LL & H Yuan (1999)  
The Mental Health Status of Women in the Navy and Marine Corps:  
Preliminary Findings from the Perceptions of Wellness and Readiness  
Assessment Military Medicine, 164(3) 174-181
- Hourani, LL; H Yuan, W Graham, L Powers, C Simon-Arndt, & B Appleton  
The Mental Health Status of Women in the Navy and Marine Corps:  
Preliminary Findings from the 1995 Perceptions of Wellness and Readiness  
(POWR) Assessment  
(1998, Center Publication, A339-334)  
Work Unit Number: Army Reimbursables 6438 and 6604

**Abstract:** Data are lacking on the health effects of women's exposure to increased combat-related and nontraditional occupational roles in the military. Patterned after the large national health surveys, the 1995 Perceptions of Wellness and Readiness Assessment was designed to provide baseline health and risk factor information on the health and mental health status of women in the U.S. Navy and Marine Corps. A population-based, two-stage, cluster sample of nearly 10,000 active-duty Navy and Marine Corps women and men were screened for above-normal levels of psychosocial distress and depressive symptomatology using standard cut-points on 2 psychiatric screening instruments. A clinically based, structured computerized telephone interview was administered to subsamples of both positive- and negative-screening volunteers to make Diagnostic Statistical Manual-III-R psychiatric diagnoses. Estimates were 40% and 21% for overall lifetime and 1-year prevalence of psychiatric disorders, respectively. Higher risks of disorder were associated with being enlisted, ever married, and having no college education. Women had about 5 times the risk of experiencing Posttraumatic Stress Disorder than men and about twice the risk of a major depressive episode. Women generally sought treatment more readily than men. Similar to findings in the civilian literature, Navy and Marine Corps women may be at higher risk for depression and Posttraumatic Stress Disorder, and men at higher risk for alcohol abuse/dependence.



- 97-41 Jung, T-P; S Makeig, AJ Bell & TJ Sejnowski  
Independent Component Analysis of Electroencephalographic and Event-related Potential Data  
Work Unit Number: ONR & NPRDC Reimbursable-6429

**Abstract:** One of the more difficult tasks in EEG research is to identify the brain locations that are the source of various EEG components. An information-theoretic approach, an Independent Component Analysis (ICA) algorithm (Bell & Sejnowski, 1995a), provides a new means of separation of EEG and event-related potential (ERP) data into spatially-fixed and temporally independent components. ICA determines what activations compose the observed EEG/ERP data by deriving spatial filters that separate evoked brain responses into a sum of spatially-fixed components with maximally independent time courses. The algorithm allows comparison of their scalp topographies and/or activations across multiple experimental conditions.

- 97-42 McKeown, MJ; S Makeig, GG Brown, T-P Jung, SS Kindermann, AJ Bell, & TJ Sejnowski.  
Analysis of fMRI Data by Blind Separation into Independent Spatial Components  
Work Unit Number: ONR & NPRDC Reimbursable-6429

**Abstract:** Current analytical techniques applied to functional magnetic resonance imaging (fMRI) data require a priori knowledge or specific assumptions about the time courses of processes contributing to the measured brain electrical signals. Here we describe a new method for analyzing fMRI data based on the independent component analysis (ICA) algorithm of Bell and Sejnowski ([1995]: Neural Comput 7:1129-1159). We decomposed eight fMRI data sets from 4 normal subjects performing various cognitive tasks. by utilizing higher-order statistics to enforce successively stricter criteria for spatial independence between component maps, both the ICA algorithm and a related fourth-order decomposition technique were superior to principal component analysis (PCA) in determining the spatial and temporal extent of task-related activation. ICA appears to be a highly promising method for the analysis of fMRI data from normal and clinical populations.

- 97-43 McKeown, MJ; T-P Jung, S Makeig, GG Brown, SS Kindermann, T-W Lee, & TJ Sejnowski.  
Transiently Task-related Human Brain Activations Revealed by Independent Component Analysis  
Work Unit Number: ONR & NPRDC Reimbursable-6429

**Abstract:** A method for detecting the time courses and spatial extent of transiently task-related activations in functional Magnetic Resonance Imaging (fMRI) data using an Independent Component Analysis (ICA) algorithm is described. Two fMRI data sets (associated with performance on the Stroop task) were analyzed for independent components described by a fixed three-dimensional spatial distribution of brain voxel values (a "map") and an associated time course of activation. For each trial, the ICA algorithm detected, without *a priori* knowledge of their spatial or temporal structure,

one consistently task-related component activated during each Stroop task block, plus several transiently task-related components activated at the onset of one or two of the Stroop task blocks only. ICA appears to be a promising tool for the exploratory analysis of fMRI data composed of spatially and temporally overlapping brain processes, particularly when their time courses of activation are not known in advance.

- 97-44 Dlugosz, L; WH Hocter, KS Kaiser, JD Knoke, JM Heller, NA Hamid, RJ Reed, SM Hilton, & GC Gray (1999)  
 Risk Factors for Mental Disorder Hospitalization after the Persian Gulf War: U.S. Armed Forces, June 1, 1991-September 30, 1993  
Journal of Clinical Epidemiology, 52(12), 1267-1278  
 Work Unit Number: 63738D P4464.001-6423

**Abstract:** Effects of Persian Gulf War (August 2, 1990 - July 31, 1991) and combat exposure on post-War hospitalization risk were evaluated through Cox proportional hazards modeling. Active-duty men (n=1,775,236) and women (n=209,760) in the Army, Air Force, Navy, and Marine Corps, had 30,539 initial postwar hospitalizations for mental disorders between June 1, 1991 and September 30, 1993. Principal diagnoses in the Defense Manpower Data Center hospitalization database were grouped into 10 categories of DSM-III-R/ICD-9-CM codes. Gulf War service was associated with significantly greater risk for acute reactions to stress and lower risk for personality disorders and adjustment reactions among men. Combat exposure was associated with greater risk for drug-related disorders among men and women in support occupations, and for alcohol-related disorders among men in combat occupations. Longitudinal studies of health, hospitalization, and exposure beginning at recruitment, are needed to better understand the impact of military operations on mental health.

#### **b. Technical Documents with abstracts; list of 1997**

Document No. (Authors/Title/Publication Data/AD#)

- 97-1A Jaeger, JA; MR White, & IT Show (1997)  
 Epidemiological Interactive System (EIPSYS) User's Guide, Version 1.0  
 (Center Publication, A326-215)  
 Work unit: 63706N M0096.002-6512

**Abstract:** The Epidemiology Interactive System (EPISYS) is a computerized program and database that enables researchers to rapidly access, analyze, and summarize large amounts of epidemiological data. This version of EPISYS contains inpatient hospitalization, demographic, and career history records of all Navy enlisted personnel on active duty between 1 January 1980 and 30 September 1994. The hospitalization data contained in EPISYS are obtained from the Naval Medical Information Management Center, Bethesda, Maryland (formerly the Naval Medical Data Services Center) is updated quarterly. Demographic, occupational, and other service history information is provided by the Navy Military Personnel Command in Washington, DC.

- 97-2B Almeida, SA; K Maxwell-Williams, RA Shaffer, JT Luz, EA Badong, & SK Brodine (1997)  
A Physical Training Program to Reduce Musculoskeletal Injuries in U.S. Marine Corps Recruits, User's Manual  
(Center Publication, A326-216)  
Work unit: 63706N M0096.008-6504

**Abstract:** Recruits at Marine Corps Recruit Depot (MCRD) San Diego are at risk for training-related musculoskeletal injuries due to the sudden increase in physical activity associated with boot camp. The annual fiscal and operational costs of these injuries were estimated at \$1;6;.5 million and 53,000 lost training days. This research evaluated the physical training schedule at MCRD and made modifications that would minimize musculoskeletal injuries without negatively impacting the mission of recruit training. Study Phases 1 and 2 included data collection to determine patterns of recruit musculoskeletal injuries and training-related physical activity. Two expert panels, with U.S. Marine Corps (USMC) and sports medicine representation, were then convened to evaluate the existing recruit physical training schedule. A modified physical training program, based on (a) scientific principles of exercise physiology, (b) research data from Study Phases 1 and 2, and (c) recommendations made by the expert panels, was jointly developed by the Naval Health Research Center and MCRD SD Recruit Training Regiment. It was concluded that a needs-specific physical conditioning program, based on scientific principles and research data, could be developed to minimize exercise-related injuries in USMC recruits without negatively impacting the mission or fitness goals of recruit training.

- 97-3C Blood, CG; JS Mark, & LP Le (1997)  
Using the Shipboard Casualty Projection System (SHIPCAS) to Forecast Ship Hits and Casualty Sustainment. (Center Publication, A326-228)  
Work unit: 63706N M0095.005-6704

**Abstract:** Medical resource planning for naval combat operations requires projections of the numbers of casualties that may be incurred by shipboard forces. The present report describes the Shipboard Casualty Projection (SHIPCAS) system in terms of a guide to its usage and a description of its statistical underpinnings. The SHIPCAS casualty projections are based on empirical data from naval combat operations during pacific operations in World War II and have been adjusted to reflect advances in weaponry and changes to ship structures that have occurred since those engagements. The simulated casualty data reflects the salient characteristics of the empirical data and the projections are consistent with the actual casualties incurred during recent naval incidents.

- 97-4D Garland, FC & S Tossey  
Physical Disability Severance Pay Separations (PDSPS) Analysis Study  
Work unit: MARCORSYSCOM Reimbursable-6616

**Abstract:** None.

- 97-5E Schneider, KE; HW Goforth Jr., & B Day  
Dietary Intake by SEALs Consuming Self-selected and Prescribed Rations  
during Mission Exercise in the Arctic  
Work unit: 62233N MM33P30.002-6412

**Abstract:** This study evaluated a commercially available dehydrated ration (AlpineAire) as an alternative to military rations for use during a mission exercise in a wet-cold environment. The study was conducted during a cold weather training exercise in the Arctic tundra on the island of Adak, Alaska. During the 24-48 hour mission exercises, SEALs were assigned to one of four groups. Weight change; nutritional intake; acceptability of self-selected, high-carbohydrate, and high-fat rations; human factors issues; and mission activity profile was documented. Low caloric intake and weight loss documented in this study is consistent with other research findings of military personnel working in cold environments. The recommended water intake of 5-6 L was met or exceeded (5-7 L) by all groups. The commercial rations were lighter in weight and comparable in taste and convenience to military rations; however, they required more water and longer preparation time.

- 97-6F Emens-Hesslink, KE; PJ Konoske, & ED Gauker (1997)  
MEDTAB & METRAK User's Guide  
(Center Publication, A331-550)  
Work unit: 63706N M0095.005-6508

**Abstract:** This command has developed medical documentation and automatic patient-tracking software that work together. The medical documentation program, called MEDTAB, was designed to allow a patient's care and treatment information to be recorded and stored as a computer record. The patient-tracking program, called MEDTRAK, automatically admits and tracks patients as they move throughout the Surgical Company. This manual contains a description of the MEDTAB and MEDTRAK hardware and software, and instructions for proper use.

- 97-7G Matheny, SA; DC Keith, SC Sundstrom, & CG Blood (1997)  
A Medical Planning Tool for Projecting the Required Casualty Evacuation  
Assets in a Military Theater of Operations  
(Center Publication, A335-748)  
Work unit: 63706N M0095.005-6704

**Abstract:** The OPTEVAC planning tool was designed to minimize the required evacuation assets (needed to transport the casualties incurred through the various echelons of medical care) by providing optimal deployment locations. This simulation tool utilizes information on the expected casualty rates, the size of theater, the desired troop deployment node and medical treatment facility (MTF) locations, and the types and numbers of available air and ground ambulances to drive the underlying linear programming algorithm which determines the optimal transportation asset locations. The OPTEVAC software then uses a modified version of the Probabilistic Location Set Covering Problem (PLSCP) to calculate the minimum numbers of ground evacuation assets along with their most appropriate locations at Echelon II and III within the theater.

### 3. Supporting Documents

#### b. Other Journal/Proceedings Published in 1997

- | <u>Report No.</u> | (Authors, title, journal)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <u>AD#</u> |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 94-11             | Goforth, HW Jr.; DA Arnall, BL Bennett, & PG Law (1997)<br>Persistence of Supercompensated Muscle Glycogen in Trained Subjects After Carbohydrate Loading. <u>Journal of Applied Physiology</u> , 82(1), 342-347                                                                                                                                                                                                                                                                                                                      | A353-982   |
| 95-4              | Jung, T-P; S Makeig, M Stensmo, & TJ Sejnowski (1997)<br>Estimating Alertness from the EEG Power Spectrum. <u>IEEE Transactions on Biomedical Engineering</u> , 44, 60-69                                                                                                                                                                                                                                                                                                                                                             | A358-312   |
| 95-8              | Williams, D; CE Englund, AA Sucec & MD Overson (1997)<br>Effects of Chemical Protective Clothing, Exercise, and Diphen-hydramine on Cognitive Performance. <u>Military Psychology</u> , 9(4), 329-358                                                                                                                                                                                                                                                                                                                                 |            |
| 95-14             | Kelly, TL; SA Gomez, DH Ryman, K Schlangen, & T Elsmore (1997)<br>The Effects of a Single dose of Pemoline on Performance and Mood during Sleep Deprivation. <u>Military Psychology</u> , 9(3), 213-225                                                                                                                                                                                                                                                                                                                               |            |
| 95-19             | Gray, GC; LB Duffy, RJ Paver, SD Putnam, & GH Cassell (1997)<br><i>Mycoplasma pneumoniae</i> : A Frequent Cause of Pneumonia among U.S. Marines in Southern California. <u>Military Medicine</u> , 162(8), 524-526                                                                                                                                                                                                                                                                                                                    | A331-486   |
| 96-9              | Kelly, TL; MM Mitler & MH Bonnet (1997)<br>Sleep Latency Measures of Caffeine Effects during Sleep Deprivation. <u>EEG &amp; Clinical Neurophysiology</u> , 102, 397-400                                                                                                                                                                                                                                                                                                                                                              | A358-263   |
| 96-27             | Simon-Arndt, C; H Yuan & L Hourani (1997)<br>Aircraft Type and Diagnosed Back Disorders in U.S. Navy Pilots and Aircrew. <u>Aviation, Space &amp; Environmental Medicine</u> , 68(11), 1012-18                                                                                                                                                                                                                                                                                                                                        | A353-973   |
| 96-36             | Araneta, MRG; CA Moore, RS Olney, L Edmons, JA Karcher, C McDonough, K Hilipoulos, K Schlangen, & GC Gray (1997)<br>Goldenhar Syndrome among Infants born in Military Hospitals to Persian Gulf War Veterans. <u>Journal of Teratology</u> , 1997, 56, 244-251                                                                                                                                                                                                                                                                        | A353-969   |
| <u>Tech Doc</u>   | (Authors, title, journal)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |
| 95-3C             | Cornelison, CM & GC Gray (1997)<br>Topical Bibliography of Published Works Regarding the Health of Veterans of the Persian Gulf War. In: The Research Working Group of the Persian Gulf War Veterans Coordinating Board. <u>Annual Report to Congress. Federally Sponsored Research on Persian Gulf Veterans' Illnesses</u> . Washington DC: Department of Veterans Affairs. (Revised 11/97, Center Publication)<br>Previous publications: (1995 Center Publication, AD# A299-143;<br>Revised, 1996 Center Publication, AD# A314-798; | A335-797   |
| No #              | Cassell GH, GC GRAY, & KB Waites (1997).<br>Mycoplasmal infections (Chapter 180). In AS Fauci, et al. (Eds.), <u>Harrison's Textbook of Medicine</u> , 14th Edition. New York, NY: McGraw-Hill Co.                                                                                                                                                                                                                                                                                                                                    |            |

**b. Other Journal/Proceedings Published in 1997 (cont.)**

- No # Cowan, DN; GC GRAY, & RF DeFraites (1997). (Letter, authors reply )  
"Birth defects among children of Persian Gulf War Veterans."  
New England Journal of Medicine, 337, 1175-76
- No # Oldfield, EG; WD Bone, CR Martin, GC GRAY, P Olson, & RF Shillaci (1997).  
Predictions of Relapse after Treatment of Coccidioidomycosis.  
Clinical Infectious Diseases, 25, 1205-10.
- No # Jansen, DL; GC GRAY, SD PUTnam, F Lynn, & BD Meade (1997).  
Evaluation of Pertussis in U.S. Marine Corps Trainees  
Clinical Infectious Diseases, 25, 1099-1107.
- No # Cowan, DN; RF DeFraites, GC GRAY, MB Goldenbaum, & SM Wishik (1997).  
The Risk of Birth Defects among Children of Persian Gulf War Veterans  
New England Journal of Medicine, 336, 1650-1656

**c. Other Technical Reports Published in 1997**

- 95-26 Merrill, LL; LK Hervig, CE Newell (1997).  
Pre-Enlistment Maltreatment Histories of U.S. Navy Trainees  
(Center Publication, B222-217)
- 95-29 Brodine, SK; RA Shaffer, CW Johnson, A Le, & C Garland (1997).  
Get SMARTS! (Sports Medicine Research Team System): A Computerized Out-patient  
Data Collection System for Epidemiologic Research  
(Center Publication, A331-435)
- 96-29 Schwerin, MJ & Sack, D (1997).  
Shipboard Women's Health Care: Provider Perceptions  
(Center Publication, A323-438)
- 96-30 Hourani, LL; SL Hurtado & WF Graham (1997).  
The Use of Total Quality Leadership in Health Promotion Activities in U.S. Navy Commands  
(Center Publication, A323-410)
- 96-31 Hagan, RD; RD Bernhard, KA Jacobs, BS Cohen & JA Hodgdon (1997).  
Evaluation of Whole-body Anti-exposure Suits during Exercise in Cold  
(Center Publication, A323-495)
- 96-33 Roberts, DE; KM Canine, & MS Freedman (1997).  
Air Quality in the U.S. Marine Corps 4-Man Tent (Center Publication, A323-408)
- 96-34 Konoske, P; R Fitzgerald, & K Emens-Hesslink (1997).  
MEDTAG: An Evaluation of Three Data Input Methods for Battle-field Medical  
Documentation (Center Publication, A323-405)
- 96-37 Reading, J; D Roberts, J Hodgdon & R Pozos (1997).  
The Effect of Hypoxia, Cold, and Exercise on Human Thermoregulation  
(Center Publication, A323-293)
- 96-40 White, MR (1997).  
Hospitalization Rates of Tuberculosis in the U.S. Navy Enlisted Personnel: A 15-year  
Perspective (Center Publication, A323-406 )

**c. Other Technical Reports Published in 1997 (cont.)**

- 96-41 Kelly, TL; D Ryman & S Pattison (1997).  
A Comparison of Two Navy Watch Schedule (Center Publication, A323-196)

**d. Technical Documents published in 1997**

- 96-9I Hourani, L; W Graham, D Sorenson, H Yuan, R Bray, S Wheelless, R Keesling, & M Rueckert (1997).  
1995 Perceptions of Wellness and Readiness Assessment (POWR'95) Methodology Report (Center Publication, A323-198)
- 96-10J Blood, CG; D Rotblatt, & JS Marks (1997)  
Incorporating Adversary-Specific Adjustments into the FORECAS Ground Casualty Projection Model (Center Publication, A323-195)
- 96-11K Almeida, SA; K Maxwell-Williams, R Minagawa, D Benas, & RA Shaffer (1997)  
Guidelines for Developing A Physical Training Program for U.S. Navy Recruits (Center Publication, A328-018)

**e. Reports "in press"**

- 96-17 Gray, GC. Respiratory pathogens. In Kelley PW (Ed), Military Preventive Medicine: Mobilization and Deployment. Washington, DC: Borden Institute (in press)

**3. Supporting Documents**

Biography and Photo of Commanding Officer



### **Biography of the Commanding Officer**

Captain Larry M. Dean received his line commission from the Naval Officer Candidate School, Newport, Rhode Island in June 1968. Upon commissioning he served shipboard as a Surface Warfare Officer with deployments to the Western Pacific and Vietnam. Following his shipboard assignment, Captain Dean served in Vietnam with the Naval Riverine Forces.

In July 1973, after completing his Master's Degree in Social Psychology at the University of Missouri, he transferred from the Line to the Medical Service Corps. His first assignment as a Research Psychologist was at the Naval Health Research Center (NHRC) in San Diego, California. At NHRC he served as Head of Fleet Research in the Environmental Medicine Department. Upon completion of his NHRC tour in 1976, he returned to the University of Missouri on a Navy Scholarship where he obtained a Ph.D. in Psychology in 1978.



His next assignment was at the Naval Submarine Medical Research Laboratory (NSMRL), Groton, Connecticut. At NSMRL he served as Director of the Psychology Department and as Laboratory Coordinator for Cold Weather Medical Research. In November 1980 he reported to the Deputy Chief of Naval Operations for Manpower, Personnel and Training (OP-01) in the Total Force Planning/Training Division (OP-11). In OP-11 he was responsible for sponsoring, planning and programming all Navy human factors R&D, as well as serving as coordinator of all manpower, personnel, training and human factors research. In June 1983 he transferred to the Navy Personnel Research and Development Center (NPRDC), San Diego, CA. At NPRDC he served as Director of the Fleet Support Office, assisting operational commands with R&D and evaluating fleet problems/issues with MPT R&D implications and solutions. While at NPRDC, he served as Acting Executive Officer and Acting Commanding Officer. In 1985 he transferred to NHRC for duty as Executive Officer. In May 1987 he was appointed interim Commanding Officer of NHRC. He served again as the Executive Officer of NHRC from July 1987 to July 1990 and again as Interim Commanding Officer from July 1990 to October 1990.

Prior to assuming command of NHRC in May 1994, Captain Dean was stationed at the Bureau of Medicine and Surgery (BUMED) in Washington, DC, from 1990 to 1994, where he served as Deputy, Assistant Chief for Operational Medicine and Fleet Support (MED-02B) and BUMED Coordinator for all medical R&D. Additionally, he was assigned to the Director, Navy Test & Evaluation and Technology Requirements (N091)

Biography of the Commanding Officer (cont.)

as Head of Medical RDT&E Programs and Requirements. Also, while at BUMED, Captain Dean served as Specialty Advisor to the Surgeon General for Research Psychology.

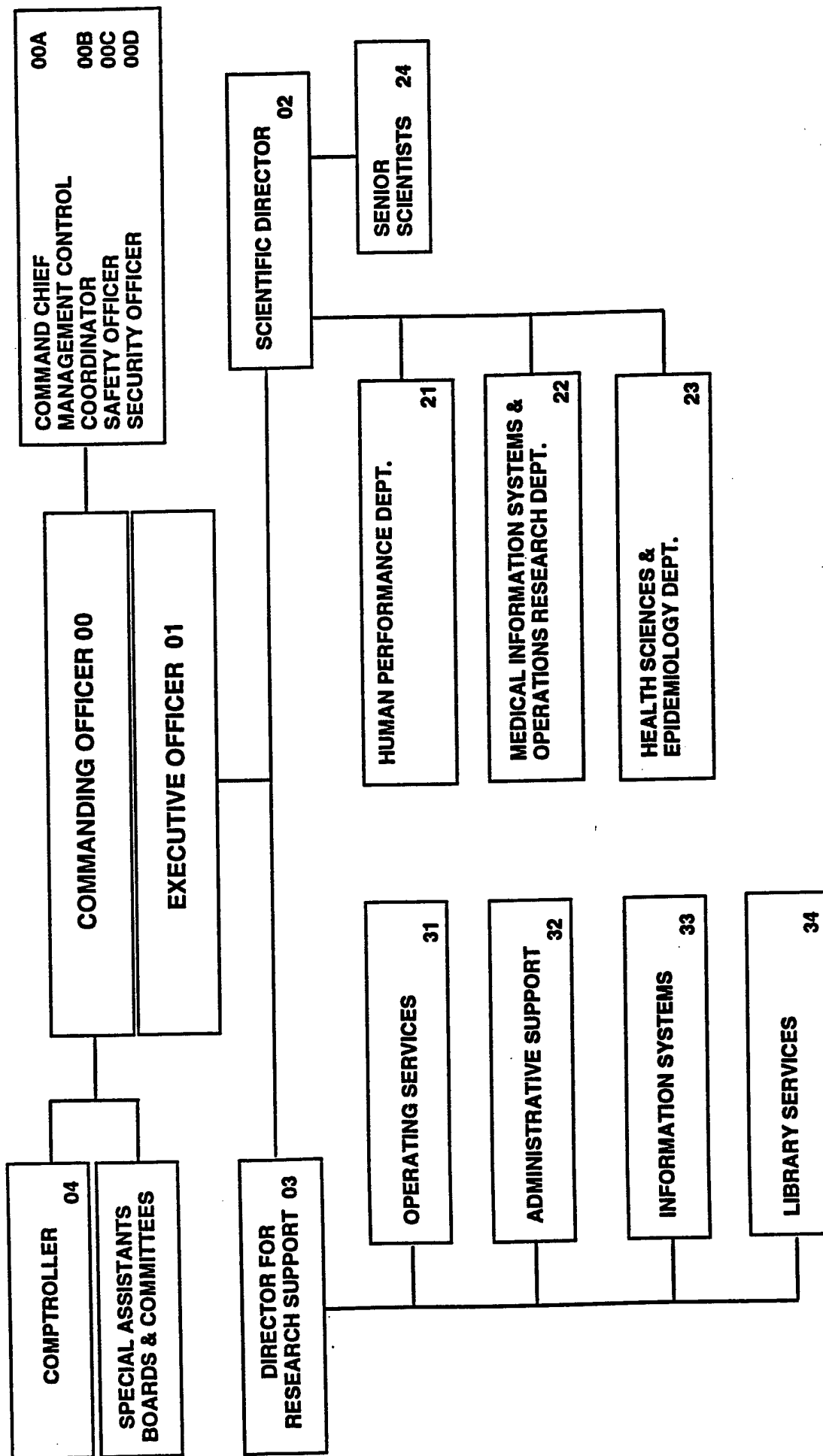
Captain Dean's professional vita includes numerous scientific publications and presentations. He is an active member in many professional and civic organizations and in his church. He is the senior Research Psychologist in the Navy. His military decorations include: Two Meritorious Service Medals, Navy Commendation Medal, Navy Achievement Medal, Combat Action Ribbon, two Meritorious Unit Commendations, National Defense Medal with Star, Armed Forces Expeditionary Medal, Vietnam Campaign Medal with 4 Stars, Vietnamese Honor Medal, Vietnamese Cross of Gallantry, Vietnamese Civic Action Medal and the Vietnam Service Medal.

Captain Dean is married to the former Danice Cotner of Cape Girardeau, Missouri, a Registered Dental Hygienist. They have 3 children, Monica (17), Derek (15), and Charles (12). They make their home in Tierrasanta.

**3. Supporting Documents**

- \* Organization Chart as of 31 December 1997
- \* Staff Directory
- \* Boards, Committees, Collateral Duties

# NAVAL HEALTH RESEARCH CENTER



|                                                                       |                          |
|-----------------------------------------------------------------------|--------------------------|
| <i>L. M. Dean</i><br>L. M. DEAN, CAPT, MSC, USN<br>COMMANDING OFFICER | <i>21 APR 96</i><br>DATE |
|-----------------------------------------------------------------------|--------------------------|

PERSONNEL DIRECTORY/TELEPHONE LIST FOR  
Naval Health Research Center, P. O. Box 85122, San Diego, CA 92186-5122

**Commercial & DSN:** (619) Prefix + ext.

**FAX:** (619) 553-9389

**E-Mail:** "last name@NHRC.Navy.Mil" except where otherwise noted

**As of 31 Dec 97**

| Code                                                                   | Name                                                           | Title                         | Bldg              | Telephone            |
|------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------|-------------------|----------------------|
| <b>OFFICE OF THE COMMANDING OFFICER</b>                                |                                                                |                               |                   |                      |
| 00                                                                     | Larry M. DEAN, CAPT/MSC/USN<br>E-Mail: <u>CO@NHRC.Navy.Mil</u> | Commanding Officer            | 306T<br>Cellular  | 553-8429<br>990-7246 |
| 00S                                                                    | Brenda M CROOKS                                                | Secretary (OA, Steno)         | 306T              | 553-8428/9           |
| 01                                                                     | J T COYNE, CDR/MSC/USN<br>E-Mail: <u>XO@NHRC.Navy.Mil</u>      | Executive Officer             | 306T<br>Cellular: | 553-8420<br>990-7191 |
| <b>SPECIAL ASSISTANTS</b>                                              |                                                                |                               |                   |                      |
| 00A                                                                    | Eduardo Ortiz, HMC/USN                                         | Command Chief                 | 310               | 553-8457             |
| 00B                                                                    | Travis LUZ, CDR MSC USN                                        | Fleet Liaison Officer         | 304T              | 553-8480             |
| 00C                                                                    | Barry S COHEN, LT/MSC/USNR                                     | Safety Officer                | 304L              | 553-0466             |
| 00D                                                                    | Eddie A LEE, LCDR/MSC/USN                                      | Security Officer              | 306T              | 553-8419             |
| 00E                                                                    | Richard A SHAFFER, CDR/MSC/USN                                 | Mgmt Control Officer          | 304T              | 553-8528             |
| <b>MARINE CORPS LIAISON OFFICER</b>                                    |                                                                |                               |                   |                      |
| SPAWAR D15                                                             | Maj Richard WILLIAMSON, USMC                                   | Liaison Officer               | 33                | 553-2751             |
| <b>SCIENTIFIC DIRECTOR AND DEPARTMENTS</b>                             |                                                                |                               |                   |                      |
| 02                                                                     | D Stephen NICE, PhD                                            | Scientific Director           | 306T              | 553-8421             |
|                                                                        | James A HODGDON, PhD                                           | Research Physiologist         | NTC               | 524-1814             |
|                                                                        | Catherine CRUMP                                                | Uniband/Technical Editor      | 306T              | 553-8423             |
|                                                                        | Michelle STOIA                                                 | MACC/Technical Editor         | 304L              | 553-8413             |
| <b>HUMAN PERFORMANCE DEPARTMENT (CODE 21)</b>                          |                                                                |                               |                   |                      |
| <b>FAX: 553-8384 (lower) 553-0677 (upper)</b>                          |                                                                |                               |                   |                      |
| 21                                                                     | W Keith PRUSACZYK, PhD                                         | (Supv Rsch Physiol) Dept Head | NTC               | 524-6728             |
| 21                                                                     | Kathleen I KUJAWA, LCDR/MSC/USNR                               | (Rsch Physiol) Asst Dept Head | NTC               | 524-1864             |
| 21A                                                                    | Marilyn MEAD                                                   | Editorial Asst (OA)           | NTC               | 524-4526             |
|                                                                        | Stephen AHLERS, CDR/MSC/USN                                    | Research Physiologist         | NTC               | 524-4520             |
|                                                                        | Timothy A LOOMIS, LTJG MSC USNR                                | Research Physiologist         | NTC               | 524-6726             |
|                                                                        | Suzanne L HINCKLEY, HM1/USN                                    | General Duty                  | NTC               | 524-4522             |
|                                                                        | Estella FIGUEROA, HM3/US                                       | General Duty                  | NTC               | 524-4522             |
| <b><u>Performance Modeling &amp; Standards Division (Code 211)</u></b> |                                                                |                               |                   |                      |
| 211                                                                    | Ross R VICKERS Jr, PhD                                         | Research Psychologist         | NTC               | 524-                 |
| 211                                                                    | Linda K HERVIG                                                 | Research Psychologist         | NTC               | 524-                 |

**Applied Physiology Division (Code 213)**

|     |                  |                       |     |          |
|-----|------------------|-----------------------|-----|----------|
| 213 | Katherine CANINE | Research Physiologist | NTC | 524-4517 |
| 213 | Jay HEANEY       | Research Physiologist | NTC | 524-4534 |
| 213 | James READING    | Research Physiologist | NTC | 524-1821 |

**Contractors:**

|  |                       |                               |     |          |
|--|-----------------------|-------------------------------|-----|----------|
|  | Don HAGAN, PhD        | Uniband/Rsch Physiologist III | NTC | 524-4516 |
|  | Donald E ROBERTS, PhD | GEO/Senior Scientist I        | NTC | 524-1822 |
|  | Sue SOBANSKI          | GEO/Technical Writer          | NTC | 524-6727 |
|  | Gretchen VURBEFF      | GEO/Scientist I               | NTC | 524-4517 |

**Special Operations Division (Code 214)**

|     |                          |                        |      |          |
|-----|--------------------------|------------------------|------|----------|
| 214 | Harold W GOFORTH Jr, PhD | Head/Rsch Physiologist | 332L | 553-8379 |
| 214 | Wayne ENSIGN, PhD        | Research Psychologist  | 332L | 553-8382 |
|     | Patty LAW                | Research Physiologist  | 332L | 553-8381 |

**Contractor:**

|  |                 |                 |      |          |
|--|-----------------|-----------------|------|----------|
|  | Kevin SCHNEIDER | GEO/Scientist I | 332L | 553-8380 |
|--|-----------------|-----------------|------|----------|

**MEDICAL INFORMATION SYSTEMS AND OPERATIONS RESEARCH DEPARTMENT (CODE 22)****FAX: 553-8551 (Topside)**

|     |                      |                                          |      |          |
|-----|----------------------|------------------------------------------|------|----------|
| 22  | William M PUGH       | (Supv Rsch Psychologist) Department Head | 331T | 553-8403 |
| 22A | Julie HEREDIA        | Editorial Assistant (OA)                 | 331T | 553-8401 |
|     | Stephanie Kewley PhD | Research Psychologist                    | 304T | 553-8465 |

|    |                                |                       |      |          |
|----|--------------------------------|-----------------------|------|----------|
| 22 | Karl F VAN ORDEN, LCDR/MSC/USN | Research Psycholgist  | 331T | 553-8408 |
| 22 | William DENISTON, LT/MSC/USNR  | Research Psychologist | 331T | 553-8408 |
| 22 | Scott MAKEIG, PhD              | Research Psychologist | 331L | 553-8414 |
| 22 | Diane WILLIAMS, PhD            | Research Psychologist | 332T | 553-9261 |

**Contractors:**

|  |                           |                           |      |          |
|--|---------------------------|---------------------------|------|----------|
|  | Robert "Bob" BARKER       | MTS/Project Co-ordinator  | 331T | 553-8410 |
|  | Karen FREEMAN             | Anteon/AIS Specialist     | 332T | 553-8785 |
|  | Ian GOCKA (Weekends only) | Anteon/Statistician       | 331L | 553-0480 |
|  | Wallace MATTERN           | MACC/Rsch Associate       | 332T | 553-8774 |
|  | Shawn WING                | Anteon/Analyst Programmer | 331L | 553-0480 |

**Medical Information Systems Division (Code 221)**

|     |                      |                          |      |          |
|-----|----------------------|--------------------------|------|----------|
| 221 | Gerald LARSON        | Research Psychologist    | 331T | 553-8402 |
| 221 | Ralph G BURR         | Statistician (General)   | 332T | 553-7760 |
| 221 | Dianna M PEARSALL    | Supv Computer Specialist | 331T | 553-8407 |
| 221 | Lawrence A HERMANSEN | Computer Specialist      | 331T | 553-9291 |
| 221 | Hoa LY               | Computer Specialist      | 331T | 553-8417 |
| 221 | Martin R WHITE       | Statistician (General)   | 331T | 553-9292 |

**Contractor:**

|  |                 |                          |      |          |
|--|-----------------|--------------------------|------|----------|
|  | Jennifer JAEGER | Uniband/Systems Analysis | 331T | 553-9289 |
|--|-----------------|--------------------------|------|----------|

|     |                  |                       |      |          |
|-----|------------------|-----------------------|------|----------|
| 221 | Lex MERRILL, PhD | Research Psychologist | 331L | 553-8418 |
|     | Carol NEWELL     | Research Psychologist |      | 553-0478 |

**Contractors:**

|  |                 |                  |      |          |
|--|-----------------|------------------|------|----------|
|  | Laura PATRIARCA | GEO/Scientist II | 331L | 553-9235 |
|  | Patricia GILMAN | GEO/Scientist II | 331L | 553-8417 |

**Operations Research Division (Code 222)**

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|-----|--------------------|-----------------------|------|----------|
| 222 | Paula KONOSKE, PhD | Research Psychologist | 331L | 553-0730 |
| 222 | Michael GALARNEAU  | Research Psychologist | 331L | 553-8411 |
| 222 | Eleanor GAUKER     | Research Psychologist | 331L | 553-8412 |
| 222 | Gerald PANG        | Computer Specialist   | 331T | 553-8409 |

**Contractors:**

|  |                        |                        |      |          |
|--|------------------------|------------------------|------|----------|
|  | Kristee EMENS-HESSLINK | GEO/Scientist          | 331L | 553-8416 |
|  | Darlene LOMBARDO       | Anteon/Program Analyst | 331T | 553-8401 |

|     |                     |                       |      |          |
|-----|---------------------|-----------------------|------|----------|
| 222 | Christopher G BLOOD | Research Psychologist | 332T | 553-8386 |
|-----|---------------------|-----------------------|------|----------|

**Contractors:**

|  |               |                  |      |          |
|--|---------------|------------------|------|----------|
|  | David C KEITH | GEO/Analyst I    | 332T | 553-8609 |
|  | Lieu P LE     | GEO/Programmer   | 332T | 553-8391 |
|  | Serge MATHENY | GEO/Scientist II | 332T | 553-8399 |
|  | G. Jay WALKER | GEO/Scientist II | 332T | 553-8393 |
|  | James ZOURIS  | GEO/Scienttist I | 332T | 553-8389 |

**HEALTH SCIENCES AND EPIDEMIOLOGY DEPARTMENT (CODE 23)**

|    |                      |                                     |      |          |
|----|----------------------|-------------------------------------|------|----------|
| 23 | Frank C GARLAND, PhD | (Supv Statistician (Hlth) Dept Head | T636 | 553-6884 |
|----|----------------------|-------------------------------------|------|----------|

**Health Sciences Division (Code 231) FAX: 553-8459**

|      |                     |                          |      |          |
|------|---------------------|--------------------------|------|----------|
| 231  | Laurel HOURANI, PhD | Supy Rsch Psychologist   | 346T | 553-8460 |
| 231A | F Rae JACKSON       | Editorial Assistant (OA) | 346T | 553-8470 |
| 231  | Patricia A COBEN    | Computer Specialist      | 346T | 553-8452 |
| 231  | Linda J TRENT       | Research Psychologist    | 346T | 553-8464 |

**Contractor:**

|  |              |                     |      |          |
|--|--------------|---------------------|------|----------|
|  | Huixing YUAN | Anteon/Statistician | 332L | 553-8450 |
|--|--------------|---------------------|------|----------|

**Clinical Epidemiology Division (Code 232) FAX: 553-8383**

|      |                                  |                        |      |          |
|------|----------------------------------|------------------------|------|----------|
| 232  | Stephanie K BRODINE, CAPT/MC/USN | Medical Officer        | 304T | 553-7809 |
| 232A | (Vacant)                         | Secretary (OA)         | 304  | 553-     |
| 232  | Richard A SHAFFER, CDR/MSC/USN   | Epidemiologist         | 304T | 553-8528 |
| 232  | J TRAVIS LUZ, CDR/MSC/USN        | Aerospace Physiologist | 304T | 553-8480 |
| 232  | Barry S COHEN, LT/MSC/USNR       | Rsch Physiologist      | 304L | 553-0466 |
| 232  | Julie MACEDO, HM3/USN            | General Duty           | 304L | 553-8396 |

|     |                 |                           |      |          |
|-----|-----------------|---------------------------|------|----------|
| 232 | Suzanne HURTADO | Research Psychologist     | 304T | 553-7806 |
| 232 | David H RYMAN   | Research Psychologist     | 304T | 553-8398 |
| 232 | Daniel TRONE    | Research Physiologist     | 304T | 553-7022 |
| 232 | Cyrene BENJAMIN | Office Automation Clerk   | 304T | 553-8519 |
|     | Pendeza GREEN   | Student Aid/SWest College | 304T | 553-8519 |

**Contractors:**

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|--|------------------------|--------------------------|------|----------|
|  | Sandra ALMEIDA, MD     | SDSU Consultant          | 304L | 553-8413 |
|  | Barbara BALES          | UCSF/Scientist III       | 304L | 553-8467 |
|  | LeAnn GAY              | Uniband/Rsch Technician  | 304T | 553-8327 |
|  | Lonna GELLES           | Uniband/Rsch Assistant A | 304T | 553-8519 |
|  | Stanley ITO            | GEO/Scientist            | 304T | 553-8448 |
|  | Anh LE                 | MACC/Computer Programmer | 304T | 553-7051 |
|  | Karen MAXWELL-WILLIAMS | Uniband/Scientist        | 3045 | 553-8372 |

|                    |                            |      |          |
|--------------------|----------------------------|------|----------|
| Rahn MINAGAWA, PhD | GEO/Senior Scientist III   | 304T | 553-7802 |
| Cathleen SWIEK     | JF/Rsch Assistant          | 304T | 553-8327 |
| Monica STARKEY     | JF/Epi Program Coordinator | 304T | 553-8445 |
| Stephen TSCHINKEL  | GEO/Scientist II           | 304L | 553-8089 |

**Occupational Epidemiology & HIV Studies Division (Code 233)**

(FAX: (619) 553-6891)

Trailer Bldg Seaside Phone

|     |                        |                        |      |          |
|-----|------------------------|------------------------|------|----------|
| 233 | EK Eric GUNDERSON, PhD | (Part time) Consultant | T635 | 553-6897 |
| 233 | Edward D GORHAM        | Statistician (Health)  | T636 | 553-6881 |
| 233 | Milan R MILLER         | Computer Specialist    | T635 | 553-6892 |
|     | Michael McNALLY        | Computer Specialist    | T635 | 553-5222 |

Contractors:

|                     |                          |      |          |
|---------------------|--------------------------|------|----------|
| Louis BALAZS        | Uniband/Systems Analyst  | T636 | 553-6887 |
| Cedric GARLAND, PhD | MACC/Epidemiologist      | T636 | 553-6888 |
| Ann Yeng WU         | MACC/Computer Programmer | T635 | 553-6894 |

**Gulf War Veterans Research Team (Code 234) FAX: 553-7601**

Bldg Phone

|     |                             |                              |      |          |
|-----|-----------------------------|------------------------------|------|----------|
| 234 | Gregory C GRAY, CAPT/MC/USN | Medical Officer              | 322T | 553-9967 |
|     | James KNOKE PhD             | Statistician (Health) (Temp) | 322T | 553-8097 |
|     | Susan HILTON                | Research Psychologist        | 322T | 553-7603 |
|     | Jason C UNRUH, HM2/USN      | General Duty                 | 322T | 553-8443 |
|     | Joseph WILLINGER, HM3/USN   | General Duty                 | 322L | 553-7465 |

Contractors:

|                    |                            |      |          |
|--------------------|----------------------------|------|----------|
| Happy ARANETA, PhD | GEO/Epidemiologist         | 322L | 553-7628 |
| Jason BARBOUR      | JF/Programmer Analyst      | 322L | 553-8770 |
| Ruth BUSH          | JF/Senior Investigator     | 346T | 553-8454 |
| Dan DESTICHE       | JF/Programmer              | 322T | 553-7597 |
| Victor GASTANAGA   | JF/SAS Programmer Analyst  | 322T | 553-9255 |
| Don GEE            | JF/FOXPRO Programmer       | 322T | 553-0028 |
| Pulak GOSWAMI      | JF/Microbiologist          | 315  | 553-8770 |
| Elizabeth HASS     | JF/Surveillance Prog Mgr   | 346T | 553-8454 |
| Tony HAWKSWORTH    | GEO/Research Assistant     | 322T | 553-7607 |
| Kathy HILIOPOULOS  | JF/Research Assistant      | 322T | 553-7522 |
| William HONNER     | JF/Research Assistant      | 346T | 553-8454 |
| Kevin KAISER       | GEO/Research Assistant     | 322T | 553-8447 |
| Debbie KAMENS      | JF/Research Assistant      | 322T | 553-8163 |
| Charles LE         | JF/Admin Asst @NMCS        |      | 532-8142 |
| Colleen McDONOUGH  | GEO/Technical Editor       | 322T | 553-7595 |
| Cassandra MORN     | JF/Research Asst           | 322T | 553-7519 |
| Pamela POBLETE     | JF/Research Assistant      | 322T | 553-0755 |
| Robert REED        | JF/Research Assistant      | 322T | 553-7433 |
| Paul SATO MD       | JF/Senior Epidemiologist   | 322T | 553-0065 |
| Karen SCHLANGEN    | JF/SASS Programmer/Analyst | 322T | 553-7598 |
| Tyler SMITH        | JF/Biostatistician         | 322T | 553-7593 |
| Paul D STAMPER     | JF/Student, UAB @NMCS      |      | 532-9242 |
| Marie STROHL       | JF/Rsch Assistant          | 322T | 553-7027 |
| Shawn WATSON       | JF/Admin Assistant         | 322T | 553-7027 |
| Andrew ZAU         | JF/Computer Specialist     | 322T | 553-0291 |



**DIRECTOR OF RESEARCH SUPPORT (Code 03)**

|     |                           |                   |      |          |
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| 03  | Eddie A LEE, LCDR/MSD/USN | Admin Officer     | 306T | 553-8419 |
| 03S | --Vacant--                | Travel Clerk (OA) | 306T | 553-8400 |
|     | Athea WILLIAMS, HM1/USN   | General Duty      | 310  | 553-8126 |

**Operating Services (Code 31)      FAX: 553-0301**

|     |                                     |                        |     |          |
|-----|-------------------------------------|------------------------|-----|----------|
| 00A | Eduardo D ORTIZ, HMC(SW/AW/FMF)/USN | Command Chief          | 310 | 553-8457 |
| 31  | --vacant--                          | Motor Vehicle Operator | 310 | 553-9460 |
| 31  | Travis L. McDEVITT, HM2/USN         | General Duty           | 310 | 553-8458 |
| 31  | Israel ORTIZ, HM3/USN               | General Duty           | 310 | 553-0463 |

**Administrative Support (Code 32)**

|    |           |                           |     |          |
|----|-----------|---------------------------|-----|----------|
| 32 | Judy Kane | (Civ) Personnel Assistant | 309 | 553-9347 |
|----|-----------|---------------------------|-----|----------|

**Information Systems (Code 33)**

|             |                    |                          |     |          |
|-------------|--------------------|--------------------------|-----|----------|
| 33          | Raymond P HILBERT  | Supv Computer Specialist | 309 | 553-8433 |
| 332         | Daniel AMARENTO    | Computer Operator        | 309 | 553-9920 |
| 331         | Richard F BOOTH    | Computer Scientist       | 309 | 553-8439 |
| 335         | Henry BULLOCK      | Computer Specialist      | 309 | 553-8345 |
| 33A         | Christina KAMFONIK | Office Automation Clerk  | 309 | 553-8432 |
| 333         | Daniel RAHILLY     | Computer Specialist      | 309 | 553-8441 |
| Contractor: |                    |                          |     |          |
|             | Adel (Del) SHARABI | JF/Computer Specialist   | 309 | 553-8437 |

**Library Services (Code 34)**

|     |                |                     |      |          |
|-----|----------------|---------------------|------|----------|
| 34  | Mary ALDOUS    | Librarian (Science) | 306L | 553-8425 |
| 341 | Betty CROFT    | Library Technician  | 306L | 553-8426 |
| 342 | Bobbie WOFFORD | Library Aide        | 306L | 553-8426 |

**OFFICE FOR THE COMPTROLLER (CODE 04)**

|     |                 |                         |      |          |
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| 04  | James E BENNETT | Financial Administrator | 306T | 553-8424 |
| 041 | Joyce TOOHEY    | Financial Admin Analyst | 306T | 553-8430 |

\* T (topside)  
L (lower deck)

## NHRC Boards and Committees

---

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**Manager:** LT W Deniston

**ASEE Coordinator** (NHRC ltr 3900, 7-17-96)

Dr S Kewley

**Audiovisual Approval/Coordinator**

HM2 I Ortiz

**Automatic Data Processing/Information Systems (ADP/IS) Program** (NHRCINST 5230.4B)

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**Network Security Officer:** Mr H Bullock

**ADP System Security Officers:**

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Code 22 - Mr G Pang

Code 23 - Ms S Hilton

Code 33 - Mr R Hilbert

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CDR S Ahlers

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**Coordinator:** HMC E Ortiz

**Members:**

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HMC E Ortiz

LCDR K Van Orden

CDR S Ahlers

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LTJG T Loomis

HMC E Ortiz

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**Ed Asst/Clerical/WG:** Civilian Personnel

**Psychology:** Mr W Pugh

**Physiology:** Dr W Prusaczyk

**Statistics:** Dr F Garland

**Computer:** Mr R Hilbert

**Clerkship Training Program (NAVMEDCOMINST 1520.13A)**

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**Command Cardiac Medicinals (NHRCINST 6470.1)**

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**Primary Corpsman:** HM1 S Hinckley

**Secondary Corpsman:** HM3 E Figueroa

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HM1 S Hinckley

**Command Collateral Duty Safety Officer (OPNAVINST 5100.23C)**

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Building 306: Ms B Croft

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Building 331: Mr M White

Building 332: Mr J Zouris

Building 346: Ms R Jackson

Building 635/6: Mr E Gorham

Building 74: Mr J Reading

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**Coordinator:** LCDR K Kujawa

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CDR E Lee

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Ms L Hervig, EEO Representative

HMC E Ortiz

HM2 I Ortiz

**Command Training Team (CTT):**

**Members:**

LTJG T Loomis

CDR E Lee

HMC E Ortiz

HM1 S Hinckley

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**Members:**

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Code 21: Dr W Prusaczyk

Code 21: HM1 S Hinckley

Code 23: Ms S Hilton

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EEO Rep: Ms L. Hervig

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Mr D Trone

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**Chaplan:** LCDR Daniel Roysden, CHC USN

**Legal:** LT Kevin O'Neil, JAGC, USNR

**Alt Medical Rep:**

**Medical Rep:** CAPT G Gray, MC, USN

**Military Rep:** CDR R Shaffer, HMC E Ortiz

**Recorder:** Ms. Ms M Stoia

**Members:**

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Code 21: Dr W Prusaczyk

Code 21: LCDR K Kujawa

Code 21: Dr W Ensign

Code 22: Dr L Merrill

Code 22: Mr M Galarneau

Code 23: Mr E Gorham

**Competition Advocate**

CDR E Lee

**Contracting Officers Technical Representative (COTR) (NAVSUPINST 4330.6A; #N66001-93-D-0021)**

**Manager:** Ms. S Hurtado (4300, Ser 496, 12/26/95)

**Alt:** CDR R Shaffer

**Drug and Alcohol Program Advisor (DAPA)**

HM1 S Hinckley

**Efficiency Review (BUMEDINST 4100.2A; NHRCINST 4100.1B, NAVFACINST 4100.8)**

HMC E Ortiz

**Energy Officer in Conjunction with SPAWAR (BUMEDINST 4100.2A; NHRCINST 4100.1B, NOSC 4100.3)**

HM2 I Ortiz

**Equipment Manager**

HMC E Ortiz

**Equal Employment Opportunity (EEO) (SECNAVINST 5350.10A)**

**Federal Women's Program (SECNAVINST 12720.5A, NAVMEDCOMSDINST 12713.2; NHRC INST 12713.1)**

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**Ethics Officer (SECNAVINST 5370.2J)**

LCDR K Van Orden

**Facilities Review Board (NHRCINST 11000.1)**

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Code 03: CDR E Lee

Code 04: Mr J Bennett

Code 21: Dr. W Prusaczyk

Code 22: Mr W Pugh

Code 23: Dr F Garland

Safety Ofcr: LT W Deniston

**Family Advocacy Program (OPNAVINST 1752.2)**

Assistance from NAVSUBBASE

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CDR E Lee

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**Asst:** Ms J Kane

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Code 21: Mr R Burr

Code 22: Ms E Gauker

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Code 33: Mr R Hilbert

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**Research Information:** Mr R Hilbert

**ISEB WG Chair:** Mr R Booth

**Members:**

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Code 03: CDR E Lee

Code 21: Dr W Prusaczyk

Code 22: Mr B Pugh

Code 23: Dr F Garland

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**Members:**

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Code 22: Mr M White

Code 23: Ms L Trent

Code 33: Mr R Booth

Code 34: Ms B Croft (non-voting member)

**Management Control Officer (SECNAVINST 5200.35B; OPNAVINST 5200.25C; BUMED INST 5200.13, NHRCINST 5200.1)**

CDR E Lee/ LCDR L Arevalo

**Military Cash Awards Program (MILCAP) (OPNAVINST 1650.8C)**

CDR R Shaffer

**Morale Welfare and Recreation Committee (Command ltr)**

**Chairperson:** LTJG T Loomis

**Secy/Treasure:**

**Members:**

Building 304: CDR R Shaffer

Building 306: Ms B Croft

Building 310: HM2 T McDevitt

Building 322: Mr T Hawksworth

Building 331: Ms J Heredia

Building 328: HM1 S Hinckley

Building 636: Mr E Gorham

**Official Mail Control Officer**

**Officer:** CDR E Lee

**Alt:** E Cordero

**PASS (Pay/Personnel Administrative Support System) Liaison Representative (OPNAVINST 1000.23A)**

**Rep:** Mr G McCurtis

**Alt:** HM2 T McDevitt

**Phlebotomy Officer (NHRCINST 6210.3)**

**Collateral Duty PO:** HM1 S Hinckley

**Physical Fitness Program (OPNAVINST 6110.1C)**

LTJG T Loomis

HM2 I Ortiz

**Physical Security Review Committee (PSRC) (NHRCINSTs 5530.1 & 5510.1C)**

**Chairperson:** CDR E Lee

**Members:**

Code 02: Dr S Nice

Code 04: Mr J Bennett

Code 21: Dr W Prusaczyk

Code 21: Dr R Vickers

Code 22: Mr W Pugh

Code 23: Dr F Garland

**Position Management Board (OPNAVINST 5310.17A; NHRCINST 5310.1)**

**Chairperson:** CDR J T Luz

**Members:**

Code 02: Dr S Nice

Code 03: CDR E Lee

Code 04: Mr J Bennett

Code 21: Dr W Prusaczyk

Code 22: Mr W Pugh

Code 23: Dr F Garland

Code 32: Ms J Kane

EEO Rep: L Hervig

**Postdoctoral Research Associateship Program for NRC and ONT**

**Coordinator:** Dr S Nice

**Advisors:**

Dr F Garland

Dr W Prusaczyk

CAPT G Gray

Dr S Makeig

**Privacy Act Coordinator (SECNAVINST 5211.5C; NHRCINST 5211.1A)**

CDR E Lee

**Public Affair Officer** (SECNAVINST 5720.44; NHRCINST 5720.1B)

CDR S Ahlers

**Records Disposal Officer** (SECNAVINST 5212.5C))

HM2 I Ortiz

**Safety Officer** (NHRCINST 5100.1B)/**Hazards Material Control Officer**(NAVSUPINST 5100.27)

**Manager:** LT W Deniston

**Asst:** HM3 J Macedo

**Hazardous Materials & Waste Officer** (NHRC 5100.1A)

**Collateral Duty:** LT W Deniston

**Safety Policy Committee** (NHRCINST 5100.23; NMRDCINST 5100.1A; BUMEDINST 5100.6A)

**Chair:** CDR J T Luz

**Members:**

Code 03: Ms B Croft

Code 21: HM3 Figueroa

Code 21: Ms L Hervig

Code 22: Mr M White

Code 23: Ms R Jackson - Traffic Safety Officer

Code 23: Mr E Gorham (Seaside)

**Manager:** LT W Deniston

**Asst:** HM3 J Macedo

**Sailor of the Quarter Committee** (NHRCINST 1700.1C)

**Chairperson:** CDR J T Luz

**Members:**

HMC E Ortiz

Officer Selected Quarterly

**Saving Bond Officer** (SECNAVINST 5120.3G)

HM2 J Unruh

**Scientific Planning and Review Committee (SPRC)** (NHRCINST 3900.2)

**Chairperson:** Dr S Nice

**Members:**

Code 21: Dr W Prusaczyk

Code 21: Dr S Ahlers

Code 22: Mr W Pugh

Code 22: LCDR K Van Orden

Code 23: Dr F Garland

Code 23: Dr L Hourani

**Security Manager** (NHRCINST 5510.1C; OPNAVINST 5510.1G) /**Security Officer** (NHRCINST 5530.1: OPNAVINST 5530.14A)

CDR E Lee/ LCDR Arevalo

**Sponsor Program Coordinator**



NHRC Boards and Committees

HMC E Ortiz

**Substance Abuse Screening Coordinator** (OPNAVINST 5350.4A)

HM2 T McDevitt

**Training Officer** (NAVMEDCOM 4651.1)

LCDR K Van Orden

**Technology Transfer Officer** (NHRCINST 5700.1A; NAVMATINST 5700.2A)

CDR R Shaffer

**Total Quality Leadership Program**

**Coordinator:** Dr. Paula Konoske, TQLC

**Command Executive Planning Committee (CEPC):**

CDR E Lee

Dr S Nice

CDR J T Luz

Dr W Prusaczyk

Dr F Garland

Mr W Pugh

HMC E Ortiz

**Voting Officer** (NHRC File 1741)

HMC E Ortiz

**Asst:** HM2 J Unruh

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**Formal Reports of Research findings  
reported during 1997 at**

**NATIONAL, INTERNATIONAL, AND REGIONAL MEETINGS  
OF SCIENTIFIC AND MEDICAL SOCIETIES**

**American Association of Neurology, New York, NY, Apr 97**

McKeown, Martin: "Analysis of FMRI Data by Decomposition into Independent Components" (with S Makeig, G Brown, T-P Jung, S Kundermann, A Bell, T Sejnowski)

**Aerospace Medical Association, Chicago, IL, 13 May 97**

Gorham, Edward D: "Prevalence Rates of reported Upper Respiratory Disease Symptoms Associated with Berthing Space Occupancy among Active-Duty Men and Women aboard U.S. Navy ships" (with FC Garland, AS Benenson, GC Gray)

Garland, Frank C: "Reproductive outcome in U.S. Navy Women: Results from the Women aboard Ship Study" (with ED Gorham)

**American College of Epidemiology, The; Annual Scientific Sessions. Cambridge, MA, 21-23 Sep 97**

Gray, Gregory C: "Increased Postwar Symptoms and Psychological Morbidity among U.S. Navy Gulf War Veterans" (with KS Kaiser, AW Hawksworth, FW Hall, E Barrett-Conner)

**American College of Sports Medicine, 44<sup>th</sup> Annual Meeting. Denver, CO, 28-31 May 97**

Buono, Michael J: "Acclimation to Humid Heat Reduces Resting Core Temperature but not Heat Storage" (with JH Heaney, SG Leichter, GK Vurbeff)

Canine, Katherine: "Regional Heat Extraction during Upper-Body and Lower-Body Exercise" (with B Bothorel, C Habib, DW Trone, GK Vurbeff)

Habib, Cynthia: "Effects of Whole-Body Cooling and Exercise Mode on Heat Strain" (with K Canine, B Bothorel, DW Trone, GK Vurbeff)

Hagan, R Donald: "Whole-Body Anti-Exposure Suits Reduce Heat Loss during Arm Exercise and Progressive Immersion in Cold Water" (with RD Bernhard, KA Jacobs, BS Cohen, JA Hodgdon)

Heaney, Jay H: "Men and Women do not reach the same Terminal Stroke Volume during Exercise in the Heat" (with MJ Buono, SG Leichter, PO2 TJ Wood)

Kaupp, Sandy: "Effect of Dietary Saturated Fat on the Production of Chylomicra enriched in Saturated Fat" (with D Puppione, WK Prusaczyk, HW Goforth)

Law, Patty G: "Abstract: Markers of Connective Tissue Formation and Degradation following downhill running" (with WK Prusaczyk, HW Goforth)

Luz, James T: "Strength training as a Predictor of Exercise-Related Lower Extremity Stress Fracture in Young Males" (with SA Almeida, JP Elder, PR Francis, RA Shaffer, DM Leone)

Reading, James E: "Gender Effects of a Cold-Air Exposure" (with DE Roberts, JA Hodgdon)

**American College of Sports Medicine, 44<sup>th</sup> Annual Meeting. Denver (cont.)**

Trone, Dan W: "Using Anthropometrics to evaluate Knee/Lower leg injury susceptibility among women Marine Corps Recruits" (with DM Leone, RA Shaffer)

Vurbeff, Grechen K: "Influence of the Normal Menstrual Cycle on Thermoregulatory Response to Exercise in Women" (with MJ Buono, P Patterson, JE Martin, JH Heaney)

**American Psychological Association, Convention, Annual, Chicago, IL, 15-19 Aug 97**

Burr, Ralph G: "Mental Health Inventory: U.S. Navy Women on Ship vs. Shore" (with LL Merrill)

Merrill, Lex L: "Pre-Enlistment Maltreatment Histories of U.S. Navy Recruits" (with Briere, MP Koss, JS Milner, SR Gold, JW White)

**International Society for Magnetic Resonance in Medicine, Fifth Scientific Meeting. Vancouver, BC, Canada, 12 Apr 97**

Laurant, Didier: "13c NMR Study of Muscle Glycogen Supercompensation" (with K Petersen, M Krssak, WK PRUSACZYK, HW GOFORTH, DL Rothman, GI Shulman)

**Neural Information Processing Systems (NIPS) Workshop Symposium Proposal Meeting. Denver, CO, Nov 97**

Makeig, Scott: "Analysis of Brain Imaging Data" (with T Sejnowski)

Makeig, Scott: "Extended ICA Removes Artifacts from Electroencephalographic Recordings" (with T-P Jung, C Humphries, T-W Lee, MJ Mckeown, V Iragui, TJ Sejnowski)

**Society for Neuroscience Meeting. New Orleans, LA, 25-30 Oct 97**

Makeig, Scott: "Independent Component Analysis of Single-Trial Event-Related Potentials" (with T-P Jung, TJ Sejnowski)

Makeig, Scott: "Independent Component Analysis finds Transient Activations in Functional Magnetic Resonance Imaging of the Stroop Effect" (with MJ Mckeown, T-P Jung, GG Brown, SS Kindermann, TJ Sejnowski)

**Society for Neuroscience Meeting. New Orleans, LA, 25-30 Oct 97**

Makeig, Scott: "Independent Component Analysis of Single-Trial Event-Related Potentials" (with T-P Jung, TJ Sejnowski)

Makeig, Scott: "Independent Component Analysis finds Transient Activations in Functional Magnetic Resonance Imaging of the Stroop Effect" (with MJ Mckeown, T-P Jung, GG Brown, SS Kindermann, TJ Sejnowski)

**Society for Psychophysiological Research. Cape Cod, MA, 15-19 Oct 97**

Makeig, Scott (invited talk): "Independent Component Analysis of Steady-State Responses" (with T-P Jung, T-W lee, TJ Sejnowski)

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**MILITARY SPONSORED MEETINGS**

**U.S. Army 8<sup>th</sup> Health Promotion Conference, "Health Promotion: The key Force Multiplier." Hyatt Regency, LaJolla, San Diego, CA, 28 Jul-1 Aug 97**

Hourani, Laurel L: "Health Behavior Profile of Military Women" (with H Yuan, LK Trent)

**Asian-Pacific Military Medicine Conference, 7th Annual, Kuala Lumpur, Malaysia, 8-3 Mar 97**

Nice, D. Stephen: "Environmental and Operational Medicine"

**65<sup>th</sup> Military Operations Research Symposium (MORS), Quantico, VA, 10-12 Jun 97**

Konoske, Paula J: "Optimization of Supply Configurations for Forward Medical Treatment Facilities"

**1997 Operational Preventive Medicine Course (OPMC), Navy Environmental and Preventive Medicine Unit No. 5, San Diego, CA, 16 Jul 97**

Brodine, Stephanie K (CAPT MC USN) [guest instructor]: "STDs in the Third World"

Coyne, John T (CAPT MSC USN) [guest instructor]: "Croatian Peacekeeping"

Gray, Gregory L (CAPT MC USN) [guest instructor]: "Gulf War Veteran Morbidity"

Shaffer, Richard A (CDR MSC USN) [guest instructor]: "Musculoskeletal Injuries"

**Navy Occupational Health & Preventive Medicine Workshop, 38th, Norfolk, VA, 7-14 Feb 97**

Coyne, John T (CAPT MSC USN): Study Group Leader for "Registered Environmental Health Specialist and Sanitation Certification Examination"

Canine, Katherine (Speaker): "Countermeasures to Heat Stress in Men and Women"

Hagan, R Donald (Speaker): "Heat Strain Countermeasures for Use during Shipboard Firefighting"

Heaney, Jay H (Speaker): "Gender Neutral and Ice Vest Physiological Heat Exposure Limits (PHEL Curves)"

Hodgdon, James A (Speaker): "Anti-exposure Suits for Use during Shipboard Flooding Operations"

Prusaczyk, W Keith (Speaker): "Thermal Protection in Naval Special Warfare Operations"

Reading, James E (Speaker): "Acute Effects of Cold and Altitude on the Performance and Health of U.S. Navy and Marine Corps Personnel"

Roberts, Donald E (Speaker): "Physiological Considerations during Cold Weather Operations"

Shaffer, Richard A (CDR MSC USN) (Speaker): "Applied Occupational Epidemiology"

**Navy Occupational Health & Preventive Medicine Workshop (cont).**

- Dlugosz, Larry J: (Poster) "Diagnosis of Mental Disorders in Department of Defense Medical Treatment Facilities after the Gulf War" (with JM Major, JD Knoke, KS Kaiser, GC Gray)
- Garland, Frank C: (Poster) "Women Aboard Navy Ships: Pertaining to the Department of the Navy Pregnancy Policy Instruction" (with ED Gorham)
- Goswami, Pulak R: (Poster) "Surveillance of Adenovirus Subtypes among Tri-service Military Recruits" (with J Callahan, AW Hawksworth, GC Gray)
- Hawksworth, Anthony W: (Poster) "Risk Factors Associated with Participation in Persian Gulf Health Registries" (with TC Smith, JD Knoke, GC Gray)
- Hourani, Laurel L: (Poster) "Health Promotion Research Reduces Health Risks" (with LK Trent, SL Hurtado, SM Hilton)
- Hourani, Laurel L: (Poster) "The Mental Health Status of Women in the Navy and Marine Corps: Preliminary findings from the 1995 Perceptions of Wellness and Readiness Assessment (POWR 95)" (with H Yuan)
- Hurtado, Suzanne L: (Poster) "Behavioral Predictors of Lifestyle Change in a Six-Year U.S. Navy Cohort" (with LK Trent, SA Frack)
- Kaiser, Kevin S: (Poster) "Hand Grip Strength in U.S. Navy Seabees in 1994-95 and Relationships to Pyridostigmine Bromide Intake during the Persian Gulf War 1990-91" (with AW Hawksworth, LJ Dlugosz, JD Knoke, GC Gray)
- Kamens, Deborah R: (Poster) "Strategies for Increasing Response Rates in Mail Surveys" (with KM Hiliopoulos, CB Morn, A Zau, GC Gray)
- Karcher, Jennifer A: (Poster) "Weekly Oral Azithromycin as Prophylactic Therapy against Agents causing Acute Respiratory Disease" (with DC McPhate, M Leionen, GH Cassell, EP Deperalta, SD Putnam, MH Sawyer, A Laurila, JD Conner, GC Gray)
- Knoke, James D: (Poster) "Hospitalizations for Emerging Illness Diagnosis among U.S. Veterans of the Persian Gulf War" (with GC Gray)
- Leone, Denise M: (Poster) "Effects of Smoking on Initial Strength Test (IST) .75 Mile run times in Women Marine Corps Recruits, Parris Island, South Carolina" (with DW Trone, KA Betsinger, RA Shaffer)
- Major, Jacqueline M: (Poster) "Finding People that have left the Military" (with CM Anderson, KM Hiliopoulos, GC Gray)
- Merrill, Lex: (Poster) "U.S. Navy Women's Satisfaction with Obstetric and Gynecological Medical Care" (with R Burr)
- Minagawa, Rahn Y: (Poster) "Assessment of a Revised Training model for the Prevention of Musculoskeletal Injuries in Female Navy Recruit Populations" (with RA Shaffer, SA Almeida, MA Stein, SK Brodine, K Maxwell-Williams)
- Smith, Tyler C: (Poster) "Does Exposure to the Destruction of Iraqi Chemical Munitions Increase the Likelihood of Postwar Hospitalizations" (with AW Hawksworth, JD Knoke, GC Gray)

**Navy Occupational Health & Preventive Medicine Workshop (cont).**

Trent, Linda K: (Poster) "Longitudinal Trends in Navy Health and Fitness (1983-1994)"  
(with SL Hurtado)

Trone, Dan W: (Poster) "Physical changes of Women Marine Corps Recruits during the  
course of Basic Training" (with DM Leone, KA Betsinger M Durm, SK Brodine, TJ Beck, RA  
Shaffer)

Tschinkel, Steve A: (Poster) "Association of Muscular and Aerobic Endurance with Overuse  
Injuries in Male U.S. Marine Corps Officer Candidates" (with DM Leone, CLW Johnson, RA  
Shaffer)

White, Martin R: "A Field Medical Surveillance System for Deployed Forces" (with W Pugh,  
K Hanson, J Angus, IT Show)

White, Martin R: "Epidemiological Interactive System (EPISYS): A Computerized Medical  
Information System" (with IT Show, EGE Gunderson, W Pugh, M Miller)

White, Martin R: "Hospitalization Rates of Tuberculosis in U.S. Navy Enlisted Personnel: A  
25 Year Perspective "

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**OTHER CONGRESSES, CENTERS, LOCAL COMMUNITY AND/OR MEDIA**

**San Diego Informs 1997. San Diego, CA, May 97**

Silva, John: "Assessing Shipboard Telemedicine" (with D Pearsall, P Melevin, H Ly)

**San Diego Biostatistics and Epidemiology Research Exchange. San Diego, CA, 2 May 97**

Dlugosz, Larry: "Diagnoses of Mental Disorders in Department of Defense Medical  
Treatment Facilities after the Gulf War" (with JM Major, D Simmes, NA Hamid, K Kaiser, JD  
Knoke, S Hilton, GC Gray)

Hamid, Nadia A: "Acquisition of Medical Records for Research on the Validity and  
Reliability of Diagnoses in the Defense Manpower Data Center Database" (with L  
Dlugosz, D Simmes, K Kaiser, GC Gray)

Hawksworth, Anthony W: "Characteristics Associated with Participation in Persian Gulf  
Health Registries" (with TC Smith, JD Knoke, GC Gray)

Kamens, Deborah R: "Strategies for Increasing Response Rates in Mail Surveys"  
(with K Hiliopoulos, CB Morn, AC Zau, CM Anderson, J Major, RL Calderon, GC Gray)

Morn, Cassandra B: "Reproductive and Perinatal Outcomes among conceptions and  
Pregnancies during the Persian Gulf War" (with DR Kamens, CM Anderson, J Karcher, KM  
Hiliopoulos, K Schlangen, HR Araneta, RL Calderon, GC Gray)

Tschinkel, Steve A: "Association of Muscular and Aerobic Endurance with Overuse Injuries  
in Male U.S. Marine Corps Officer Candidates" (with DM Leone, CLW Johnson, RA Shaffer)

## 1997 Command History

### **San Diego Biostatistics and Epidemiology Research Exchange (cont).**

Poblete, Pamela: "Self-Administered Survey vs. Telephone Interview: A Reliability Study of Reproductive Outcomes" (with CB Morn, MR Araneta AC Zau, KM Hiliopoulos, DR Kamens, PA Sato, GC Gray)

Simmes, Diana: "Rates of Hospitalization for Alcohol-related Disorder in the U.S. Armed forces, 1, June 1993 – 30, September 1993" (with L Dlugosz, JM Major, GC Gray)

### **Command In-house 1997 Presentations** ('Brown Bag' held at noon in Bldg 335 Conference Room)

11 Mar - LCDR Joanne Shields, MSC USNR: "Cluster Investigations"  
Reservists, Environmental Epidemiologist from the State of Washington

5 Jun -LCDR Steve Ahlers, MSC, USN: "Global Positioning System Technology and Naval Special Warfare Combat Swimmer Training"

18 Jun - Jerry Larson: "Behavioral Measures of Conscientiousness" Visiting Speaker, Navy Personnel Research and Development Center, San Diego

18 Nov -Brenda Crooks: "Native Americans" (in observance of November being designed as 1997 Native American Heritage Month by the President and Congress)

### 3. SUPPORTING DOCUMENTS

#### 1997 CIVILIAN HONORS, AWARDS AND OTHER INFORMATION

##### **Degrees/Academic**

Dec Dr. Edward Gorham received his Ph.D. in Public Health (Epidemiology) from University of California San Diego and San Diego State University as part of their joint doctoral program

##### **Special Achievement Award**

To: D. Stephen Nice, Ph.D. 19 Nov 97  
For: Sir Henry Wellcome Medal and Prize, for his paper "Long-term Health Outcomes and Medical Effects of Torture among U.S. Navy Prisoners of War in Vietnam."  
Presented by the Association of Military Surgeons of the United States and Burroughs Wellcome Fund at the 104th AMSUS Annual Meeting, Nashville, Tennessee

##### **Retirements**

May Mathew Sinclair, Electronics Technician, retired on 25 May after serving 25 years at NHRC (Feb 72 to May 97). Prior to 1972, he served in the U.S. Navy.

Aug Ralph Garcia, Motor Vehicle Operator, retired on 30 Aug after serving 24 years at NHRC (Jan 73 to Aug 97). Prior to 1973, he served in and retired from the U.S. Navy.

Dec Michael McNally, (Computer Specialist, retired on 31 December, having served 24.5 years at NHRC (Aug 73 to Dec 97). Prior to 1973, he served in and retired from the U.S. Navy (HMC USN/Ret.)

##### **Letters of Appreciation**

From: Commanding Officer, Navy Environmental Health Center, Norfolk VA, dtd 17 Mar 97  
For: Presentations (titles by their names) at the 38th Navy Occupational Health and Preventive Medicine Workshop, Norfolk, VA, 7-14 Feb 97

To: Canine, Katherine: "Countermeasures to Heat Stress in Men and Women"  
Hagan, Donald R: "Heat Strain Countermeasures for Use during Shipboard Freighting"  
Heaney, Jay H: "Gender Neutral and Ice Vest Physiological Heat Exposure Limits (PHEL Curves)"  
Hodgdon, James A: "Anti-exposure Suits for Use during Shipboard Flooding Operations"  
Prusaczyk, W Keith: "Thermal Protection in Naval Special Warfare Operations"  
Reading, James E: "Acute Effects of Cold and Altitude on the Performance and Health of U.S. Navy and Marine Corps Personnel"  
Roberts, Donald E: "Physiological Considerations during Cold Weather Operations"



## 1997 Command History

From: Commanding Officer, Navy Environmental Health Center, Norfolk VA, dtd 16 Apr 97  
For: Poster presentations (titles by their names) at the 38th Navy Occupational Health & Preventive Medicine Workshop, Norfolk, VA, 7-14 Feb 97  
To: Garland, Frank C; Edward D Gorham - "Women Aboard Navy Ships: Pertaining to the Department of the Navy Pregnancy Policy Instruction"  
Dlugosz, Larry J; Jacqueline M Major, James D Knoke, Kevin S Kaiser, CAPT GC Gray - "Diagnosis of Mental Disorders in Department of Defense Medical Treatment Facilities after the Gulf War"  
Goswami, Pulak R; Johnny Callahan, Anthony W Hawksworth, CAPT GC Gray - "Surveillance of Adenovirus Subtypes among Army, Navy, Marine Corps and Air Force Recruits"  
Hawksworth, Anthony; Tyler C Smith, James D Knoke, CAPT GC Gray - "Risk Factors Associated with Participation in Persian Gulf Health Registries"  
Hourani, Laurel L; Linda K Trent, Suzanne L Hurtado, Susan M Hilton - "Health Promotion Research Reduces Health Risks"  
Hourani, Laurel L; Xuixing Yuan - "The Mental Health Status of Women in the Navy and Marine Corps: Preliminary findings from the 1995 Perceptions of Wellness and Readiness Assessment (POWR 95)"  
Hurtado, Suzanne L; Linda K Trent, Seth A Frack - "Behavioral Predictors of Lifestyle Change in a Six-Year U.S. Navy Cohort"  
Kaiser, Kevin S; Anthony W Hawksworth, Larry J Dlugosz, James D Knoke, CAPT GC Gray - "Hand Grip Strength in U.S. Navy Seabees in 1994-95 and Relationships to Pyridostigmine Bromide Intake during the Persian Gulf War 1990-91"  
Kamens, Deborah R; Katia M Hiliopoulos, Cassandra B Morn, Anthony Zau, CAPT GC Gray - "Strategies for Increasing Response Rates in Mail Surveys"  
Karcher, Jennifer A; DC McPhate, M Leionen, GH Cassell, EP Deperalta, SD Putnam, MH Sawyer, A Laurila, JD Conner, CAPT GC Gray - "Weekly Oral Azithromycin as Prophylactic Therapy against Agents causing Acute Respiratory Disease"  
Knoke, James D; CAPT GC Gray - "Hospitalizations for Emerging Illness Diagnoses among U.S. Persian Gulf War Veterans"  
Leone, Denise M; Daniel W Trone, Kelli A Betsinger, CDR RA Shaffer - "Effects of Smoking on Initial Strength Test (IST) 0.75 Mile run times in Women Marine Corps Recruits, Parris Island, South Carolina"  
Major, Jacqueline M; Christy M Anderson, Katia M Hiliopoulos, CAPT GC Gray. "Finding People that have left the Military"  
Merrill, Lex L; Ralph Burr - "U.S. Navy Women's Satisfaction with Obstetric and Gynecological Medical Care"  
Minagawa, Rahn Y; CDR R A Shaffer, Sandra A Almeida, Mark A Stein, CAPT SK Brodine, Karen Maxwell-Williams - "Assessment of a Revised Training model for the Prevention of Musculoskeletal Injuries in Female Navy Recruit Populations"  
Smith, Tyler C; Anthony W Hawksworth, James D Knoke, CAPT GC Gray - "Does Exposure to the Destruction of Iraqi Chemical Munitions Increase the Likelihood of Postwar Hospitalizations"  
Trent, Linda K; Suzanne L Hurtado - "Longitudinal Trends in Navy Health and Fitness (1983-1994)"  
Trone, Dan W; Denise M Leone, Kelli A Betsinger, Mary Durm, CAPT SK Brodine, TJ Beck, CDR RA Shaffer - "Physical changes of Women Marine Corps Recruits during the course of Basic Training"  
Tschinkel, Steve A; Denise M Leone, Chrisanna L Weech-Johnson, CDR RA Shaffer - "Association of Muscular and Aerobic Endurance with Overuse Injuries in Male U.S. Marine Corps Officer Candidates"

### 3. Supporting Documents

#### 1997 MILITARY HONORS, AWARDS AND OTHER INFORMATION

**Sailor of the Year:** No selection.

**Sailors of the Quarter:** Jan-Mar: HM3 Israel Ortiz, USN Jul-Sep: No selection  
Apr-Jun: No selection Oct-Dec: No selection

**Promotions:**

12 Jun HM2 Hinckley to HM1  
12 Jun HN Boyer to HM3  
12 Jun HN Macedo to HM3  
1 Jul CDR J. T. Coyne, MSC, USN to CAPT  
1 Jul CDR Gregory C. Gray, MC, USN to CAPT  
1 Jul LCDR Richard Shaffer, MSC, USN to CDR

**Other**

**a. Transfers: Active Duty**

**outgoing:**

10 Feb HM2 Tristan J. Wood, USN, transferred  
22 Jun HM1 Athea Williams, USN transferred to Japan

**incoming:**

24 Jan HMC(SW/AW/FMF) Ed D. Ortiz, USN, Command Chief  
30 Jan Travis L. McDevitt, USN  
5 Mar LT William Deniston, MSC, USNR, Research Psychologist, reported onboard to Code 22.  
27 Aug CDR(Sel) Stephen Ahlers, MSC, USN, Research Physiologist, reported onboard to Code 21  
25 Sep LTJG Timothy A. Loomis, MSC USNR, reported onboard from OIS Newport, RI. He is a Research Physiologist coming from Auburn University.

**b. Training**

20-21 Jan LTJG Timothy Loomis, MSC USNR and LT William Deniston, MSC, USNR, Casualty Assistance Calls Officer Training at Fleet Training Center, San Diego

**Retirements/Discharges**

31 May HMC Jose V. Reyes, USN  
18 Aug HN Estella Figueroa, USN, discharge and re-enlisted  
12 Nov HM3 Dominique Boyer, USN, discharged

**Certificate of Commendation**

To: HN Julie D. Macedo, USN (Delivered 10 March)  
From: Commanding General, MCRD/ERR, Parris Island, SC

**Letters of Appreciation**

To: John T. Coyne, CAPT MSC USN  
From: Commanding Officer, Navy Environmental Health Center, Norfolk VA, dtd 13 Mar 97  
For: Study Group Leader for "Registered Environmental Health Specialist and Sanitation Certification Examination" at the 38th Navy Occupational Health & Preventive Medicine Workshop, Norfolk, VA, 7-14 Feb 97

To: Shaffer, Richard A, (CDR MSC USN)  
From: Commanding Officer, Navy Environmental Health Center, Norfolk VA, dtd 13 Mar 97  
For: Presentation "Applied Occupational Epidemiology" at the 38th Navy Occupational Health & Preventive Medicine Workshop, Norfolk, VA, 8-14 Feb 97

To: \*Stephanie Brodine, CAPT MC USN, Topic: "STDs in the Third World"  
\*John T Coyne, CAPT MSC USN, Topic: "Croatian Peacekeeping"  
\*Gregory L Gray, CAPT MC USN, Topic: "Gulf War Veteran Morbidity"  
\*Richard A Shaffer, CDR MSC USN, Topic: "Musculoskeletal Injuries"  
From: Commanding Officer, Navy Environmental and Preventive Medicine Unit No. 5, San Diego, CA dtd 25 Nov 97  
For: Serving as guest instructors at EMPU5's 1997 Operational Preventive Medicine Course (OPMC) on 16 Jul 97

To: Richard A Shaffer, CDR MSC USN  
From: Adolescent Medicine Division, Department of Pediatrics, Naval Medical Center, San Diego, CA dtd 7 Dec 97  
For: Teaching research design, methodology, epidemiology and biostatistics courses to the Adolescent Medicine fellows and staff. The required courses provide a foundation to pursue research interests and to meet the Resident Review Committee's requirements for accreditation.

Logistic Support

The Center, a shore (field ) activity is a tenant command of Space and Naval Warfare Systems Center, San Diego (SPAWARSYSCEN SAN DIEGO) in an active operating status under a Commanding Officer, and under the command and support of the Chief, Bureau of Medicine and Surgery exercised through the Commanding Officer, Naval Medical Research and Development Command, Bethesda, Maryland. The Center is under the area coordination authority of CINCPACFLT and regional coordination of the Commander, Naval Base, San Diego, California.

The logistic support is as follows:

- a. SPAWARSYSCEN SAN DIEGO provides direct logistic support to NHRC for functions of public works coordination for exterior areas, plant security and fire protection, civilian food service, safety program, and routine preventive maintenance for plant facilities.
- b. Defense Automated Printing Service (DAPS), Point Loma, provides printing services on a reimbursable basis.
- c. Naval Medical Center, San Diego (NMCS), or Naval Training Center Branch Clinic of NMCS, provide medical treatment for active duty personnel.
- d. Naval Dental Clinic of the Naval Submarine Base provides dental treatment.
- e. Naval Submarine Base provides berthing and military food service for military personnel.
- f. Naval Supply Center, Charleston, South Carolina, provides civilian payroll services and authorization accounting activity services.
- g. Human Resource Branch Office, NMCS, provides and administers civilian personnel functions and EEO programs.
- h. Personnel Support Activity Detachment, Point Loma, provides disbursing, travel, and military personnel procedures.
- i. Public Works Center provides maintenance and public works functions, transportation, and building custodial services on a reimbursable basis.
- j. Naval Legal Service Office, San Diego, provides command legal assistance.

**1997 VISITORS\***

19 Feb CAPT Jerry Patee, Bureau of Medicine and Surgery (BUMED), Washington

20 Feb CAPT Dennis Deakins, MC USN/FS, CAPT John Tueller, MC, USN, LCDR Tim Breier, MSC, USN, & HMC Chris Rohrer, HMC/FMF/USN COMNAVAIRPAC San Diego  
CAPT David Snyder, MC, USN/FM COMNAVSURFEPAC, San Diego

25 Feb Carol A Mutter, LtGen/USMC, DC/S Manpower & Reserve Affairs, Washington, DC

6 Mar CAPT David Trump, MC, USN, Office of the Special Assistant for Gulf War Illness, Falls Church, VA

6 May CAPT Michael Curley, Edward Cudahy, LT John R Sims, Naval Submarine Medical Research Laboratory, Groton, CT

13 May CAPT T. Contreras, Naval Medical Research Institute, Bethesda, MD

13 May Thomas N. Jones, Naval Medical Research & Development Command, Bethesda, MD

28 May CAPT Jerry Patee, BUMED, Washington, DC

3 Jun Mary Beth Kiss, U.S. Naval Institute

6 Jun Bernard Rostker, ASN (M&RA) Pentagon Washington, DC

6 Jun CAPT David Trump, MC USN, & CAPT Stephen Terry, MC USN, Office of the Special Assistant for Gulf War Illness, Falls Church, VA

16 Jun M. Herron, et al., GEO Centers, Rockville, MD

24 Jun CAPT Hollingsworth, HSO, San Diego

25 Jun Yana Ginsberg, Navy Times )

7 Jul Tim Loomis, Officer candidate

24 Jul Bart Kuhn, OUSD(A&T/ODDR&E, Washington DC

6 Aug CDR Freda Vaughn, HQ Marine Corps, Washington, DC

8 Sep VADM Koenig, Navy Surgeon General, Sheila Graham, BUMED PAO, HMC Mike Stewart, Force Master Chief, BUMED Washington, DC; CAPT David A. Snyder, MC USN, Force Surgeon, COMNAVSURFPAC, San Diego; CAPT

\* Omissions not intentional

1997 Command History-NHRC

1997 visitors cont.

17 Sep David Speser, Foresight Science & Technology  
19 Sep LCDR M Ryan and CDR Habergetger  
28 Oct CAPT Carnes  
29 Oct Nancy Miller, Deputy EEO Officer, & Diana G-Moskie, EEO Specialist, FISC, San Diego  
29 Oct LCDR Corley E. Puckett, Executive Officer, Naval Submarine Medical Research Laboratory, Groton, CT  
30 Oct Larry Edmunds, CDC re Birth defect surveillance (Gray)  
6 Nov Ray Poitera & Ron Peltier, Uniband Inc., Belcourt, ND  
Monty Herron, & Anne Street, GEO Genters, Rockville, M  
17 Nov CAPT Jeff Young, MC, USN, OIC, SWIM/Submarine Base, San Diego  
20 Nov Larry Cereghino, Col USA, Office Special Assistant, Annandale, VA

**3. Supporting Documents**

- \* Miscellaneous - Quarterly NHRC Updates

# NHRC UPDATE

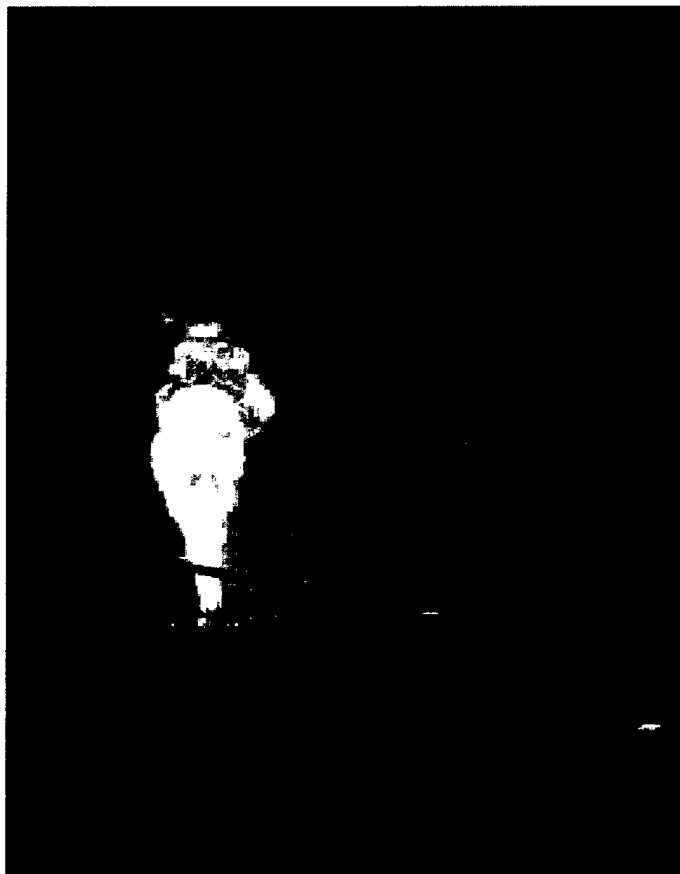
January 1997

Issue No. 4

*This update is published quarterly to highlight NHRC contributions to the Navy and Marine Corps as well as the scientific community.*

## NHRC Scientists Lead Epidemiological Research on Gulf War Veterans

The health of the veterans who served in the Gulf War has been a matter of intense public interest and of great concern to health care providers and planners at the Department of Defense and the



Department of Veterans Affairs. In the Spring of 1994, the Assistant Secretary of Defense for Health Affairs tasked the Naval Health Research Center to develop comprehensive epidemiologic studies among Gulf War veterans. In response to this tasking, Captain (select) Greg Gray, a Navy physician and epidemiologist, assembled a strong multi-disciplinary team at NHRC and established effective research partnerships with eminent scientists at the University of California, San

Diego; the Walter Reed Army Institute of Research; the Centers for Disease Control and the Department of Veterans Affairs.

In a study recently published in the *New England Journal of Medicine*, Dr. Gray and his colleagues examined the hospitalizations of 1.1 million veterans. The researchers looked at a broad spectrum of diagnosis from August 1991 until September 1993. Screening the 487,549 hospitalizations which occurred during this 2-year period, the team found that the 547,076 Gulf War veterans had the same postwar overall hospitalization experience as their 618,333 nondeployed peers of the same era.

Differences in hospitalization experience for specific diagnostic categories were found between the two populations, but these differences were consistent with research findings from other wars and attributed to other reasons. The results of the study suggested that after the war, there was no increased risk of "any cause" hospitalization among Gulf War veterans compared with nondeployed veterans. Gulf War veterans had a different risk of hospitalization than did nondeployed veterans in 16 of 42 diagnostic category comparisons. In four of these 16 different comparisons, Gulf War veterans were at increased risk: neoplasms during 1991 (largely benign), diseases of the genitourinary system during 1992, diseases of the blood and blood-forming organs during 1992 (mostly anemias), and mental disorders during 1992 and 1993. These differences were not consistent over time and could be explained by deferred care, postwar pregnancies, and postwar stress.

This work is one of the first large-scale studies to compare health outcomes among Gulf War veterans with appropriate comparison groups of other active duty personnel. According to Dr. Gray, additional NHRC



studies which have been strongly endorsed by the Institute of Medicine, will focus upon symptoms, reproductive health, and hospitalizations among various groups of Gulf War veterans. One such study will compare hospitalizations among Gulf War veterans who may have been exposed to the destruction of Iraq's Khamisiyah ammunition dump in March 1991.

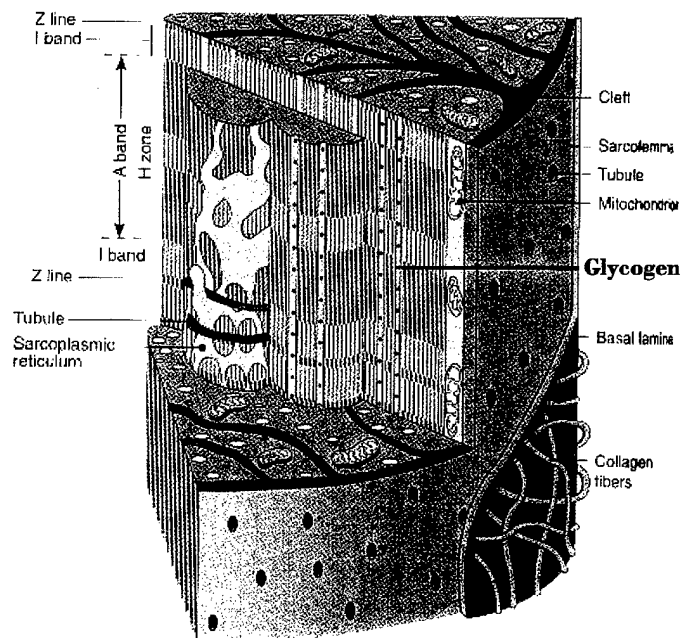
## NHRC Physiologists Develop Methods to Sustain Physical Performance of Special Operations Personnel

Special forces operators (SEALs, Force Recons, ANGLICO, etc.) often perform physically demanding tasks at the limits of human endurance to achieve mission success. Their primary

attacks against enemy ships and piers, and 5) direct actions against military targets on shore or at sea. NHRC researchers have been studying special operations mission requirements for several years and have identified a number of methods and techniques to enhance or sustain physical performance under extreme environmental conditions.

The NHRC Special Operations Division, composed of exercise physiologists, exercise biochemists, nutritionists, and statisticians, works with the special forces community on a daily basis to study the efficacy of physical training, nutritional and ergogenic interventions. Nutritional strategies include carbohydrate loading and supplementation, creatine supplementation, and hyperhydration. Guidelines for applying these interventions have been published and distributed to special operations commanders and medical officers.

Carbohydrate loading, a method used to increase muscle glycogen to abnormally high levels



Source: *Exercise Physiology*: McArdle, Katch & Katch (Eds.) Williams & Wilkins, 1996

Glycogen storage within the muscle fiber

missions, which are clandestine and performed by small units, include 1) beach surveys in support of amphibious operations, 2) reconnaissance and intelligence gathering, 3) rescue of downed pilots and extraction of personnel from denied territory, 4) limpet (ordnance)

(supercompensation), is a common practice among endurance athletes. This increases the time that an athlete can maintain a given power output and thus extends his/her exercise endurance time. Carbohydrate loading also has potential to sustain physical performance during special operations missions; however, unlike athletic events military operations may

be delayed for several days, and the glycogen levels may return to normal before the mission. In a recent study published in the *Journal of Applied Physiology*, Dr. Goforth and his colleagues found that supercompensated muscle glycogen can persist in special forces personnel for at least 3 days if physical activity is limited. This indicates that carbohydrate loading has sufficient flexibility for use by special operations personnel in an operational setting even if the mission is delayed. Armed with this information, the NHRC team is now working with colleagues at the Yale University Medical Center using Nuclear Magnetic Spectroscopy to test two modified carbohydrate loading procedures. In contrast to the previous study, these protocols include daily exercise and are designed to achieve and maintain muscle glycogen supercompensation and fitness for 3-6 days.

The NHRC researchers are also working with special operations personnel to evaluate physical training techniques, which involve eccentric training (downhill running) to toughen muscles and reduce muscle soreness, and short-term, high intensity cycle exercise to simultaneously increase aerobic and anaerobic capacities. These studies are being conducted in collaboration with researchers from the Canadian Defense and Civil Institute of Environmental Medicine; Northern Arizona University; University of California at Los Angeles, and Yale University. Our close proximity to the Navy and Marine Corps special forces provides NHRC researchers the ability to fully understand mission requirements, execute high tempo field research activities, and effectively transition biomedical technologies and interventions to these highly specialized communities.

## NHRC Researchers Explore the Cycle of Domestic Violence

Violence directed toward an intimate partner or a child is an issue of great national concern and is an area of special interest within the Bureau of Naval Personnel (BuPers). As part of a broad set of initiatives to prevent and treat domestic violence in the Navy, BuPers has tasked NHRC researchers to identify factors associated with domestic violence, including the view that childhood experiences in the

family of origin may contribute to the risk of child abuse during adulthood. In a study recently published in the journal of *Child Abuse & Neglect*, Dr. Lex Merrill and his colleagues, including Ms. Linda Hervig at NHRC and Dr. Joel Milner at Northern Illinois University surveyed 3,776 female and male recruits to determine their histories of physical abuse, alcohol misuse, and their potential for child abuse.

The results of the study showed that 31% of the female and 20% of the male recruits witnessed parental violence and about 40% of all recruits experienced at



Navy recruits at RTC, Great Lakes

least one instance of childhood physical abuse. The study also found that a pattern of violence in women, such as receiving physical abuse as a child or inflicting physical violence on an intimate partner, increased the risk of child physical abuse. Being a victim of child abuse also increased the potential for child abuse among men. A history of alcohol misuse was also a predictor of intimate partner abuse and injury, as well as the potential for child abuse.

NHRC researchers are currently extending these findings through a 4-year longitudinal study in conjunction with Northern Illinois University and in collaboration with researchers at the University of Southern California, University of Arizona, and the University of North Carolina. This study, which is being supported by the Navy Family Advocacy Program in the Bureau of Naval Personnel, will determine the impact of premilitary maltreatment histories on the careers of Navy personnel, long-term health care consequences, and the risk for revictimization and recidivism. Results from this research will assist the Bureau of Naval Personnel in its proactive approach to the prevention and management of domestic violence.

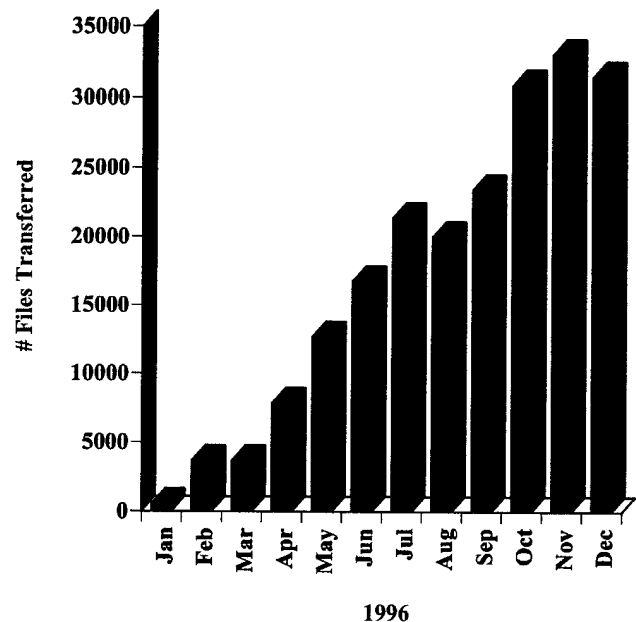
## NHRC World Wide Web Site

### ***N091 and ONR Essential to Biomedical Fleet Support***

About one-half of the research programs at the Naval Health Research Center are supported by the Director of Navy Test & Evaluation & Technology Requirements (N091) and are executed through the Office of Naval Research. With input from the Navy and Marine Corps operational commanders, N091 establishes our research requirements and provides fiscal support. As the execution sponsor, the Office of Naval Research manages the resources, maintains high standards of quality, and ensures the development and integration of research findings and technologies from both the private and public sectors.

The remaining one-half of our research programs are supported directly by our operational customers, which include the Navy, Marine Corps, Army, and Department of Defense. Each of our research programs is managed through the Naval Medical Research and Development Command, our parent command, which provides administrative support, and program guidance and oversight. We are deeply indebted to each of these organizations for their critical roles in helping NHRC support our operational forces through biomedical research and development.

The NHRC home page was developed to provide on-line access to information about the Naval Health Research Center. A cyberstroll through this website provides hyperlink access to organizational overviews, current research programs, publication abstracts, administrative information, copies of the NHRC "Update", links to other important websites, and even the 5-day weather forecast and visitor information for San Diego. Over 1,000 people per day from 50 different



**File transfer activity to outside sources  
accessing the NHRC Web site**

countries are currently visiting our site to learn more about our Navy and Marine Corps research in operational epidemiology, medical operations research, medical and performance modeling, operational performance assessment and enhancement, medical informatics, health promotion, and readiness standards. We hope to see you soon.

# NHRC UPDATE

April 1997

Issue No. 5

*This update is published quarterly to highlight NHRC contributions to the Navy and Marine Corps as well as the scientific community.*

## NHRC Scientists Develop Breakthrough Alertness Monitoring Technology

The Office of Naval Research is supporting an exciting, high tech research program at NHRC to develop a capability to monitor alertness among Navy personnel in critical positions or situations. At least five trends make alertness an increasingly important issue for the future of the Navy and Marine Corps. First, the number of workers, both military and civilian, whose positions are staffed around the clock is steadily increasing. The Office of Management and Budget recently pointed out that the U.S. Navy is the world's largest employer of shift work personnel and urged the Navy to increase its attention to alertness and fatigue issues. Second, there is increasing pressure to radically reduce staffing in all positions, including ship crews. The current Navy Smart Ship project is attempting to reduce crew staffing by at least half through increased automation and system integration.



This may leave many key work stations under the watchful eyes of solitary operators without close supervision or an available relief.

Ever-increasing automation poses a third challenge to maintaining vigilance and alertness. While computerized information systems can collect and display more and more detailed information, these

systems may frequently leave their operators with little to do but monitor the streams of information they provide. Meanwhile, the ability of operators to maintain alertness and vigilance under such conditions has not increased and is bound by definite psychophysiological limits.

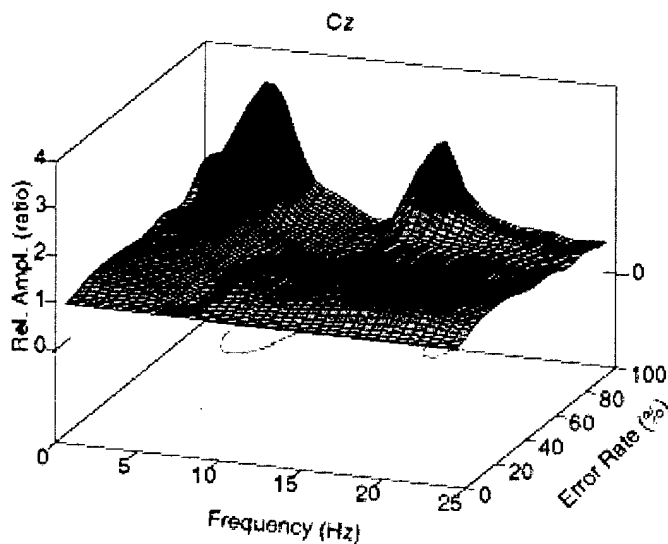
A fourth trend contributing to the growing importance of alertness in overall military performance is the increasing need for and frequency of global travel, often leading to jet lag or "desynchronization" in which body rhythms and work schedule become out of sync with one another. Alertness problems occur most often under "contra-circadian" conditions, when our natural body clocks make us inclined to sleep while our work schedule, new time zone, or unforeseen events require us to work. Finally, modern warfare doctrine relies heavily on night operations, further increasing the "circadian stress" on front line fighters and their commanders during training and combat missions.

Research at NHRC has shown that precise information about an operator's current state of alertness is available in the small fluctuating electrical currents produced by the brain. These "electroencephalographic" or EEG signals, can be noninvasively recorded from the scalp, and change in size, location, and frequency as alertness diminishes. In the early phases of this work, Dr. Scott Makeig and colleagues at NHRC began studying the EEG of subjects who were attempting to press a response button whenever they heard a weak target sound during boring half-hour sessions conducted in a small, dark, sound-attenuated chamber.

Under these conditions, it was particularly difficult for subjects to stay alert and a wide range of performance changes resulted. Very few of the subjects were able to respond to every target. Instead, in many sessions the subject experienced "waves" of

drowsiness lasting four minutes or longer in which they could respond only intermittently or not at all. After such a session, the subject would typically remember struggling to stay awake but would often severely underestimate the number of targets they had missed. Further research by Dr. Makeig and his colleagues, published last year in the journal *Cognitive Brain Research*, showed that the periods of intermittent responding during drowsiness have a definite time pattern which in most subjects consists of a series of 15-20 second dips into unawareness, much like listeners who find themselves "nodding off" during a boring lecture in a dark room or while reading an article such as this.

In 1993, Dr. Makeig and Mark Inlow published a paper in a leading EEG journal showing that these waves of drowsiness are accompanied by very specific changes in EEG patterns, and that these changes can be used to estimate changes in a subject's vigilance

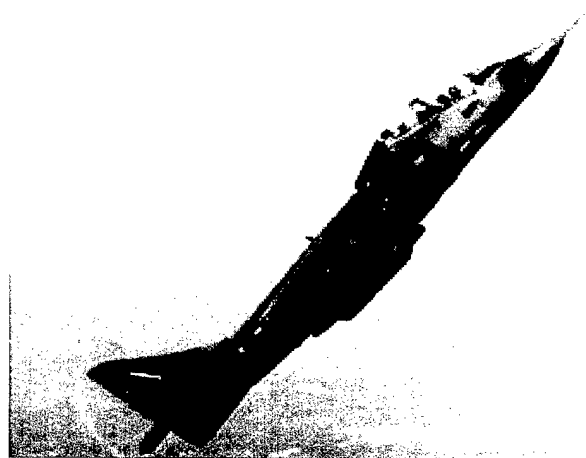


**3-D EEG plot to predict vigilance performance**

performance. Further research established that while these changes vary somewhat from subject to subject, within subjects they are invariant and can be detected on-line in near real time. Working with Drs. Terrence Sejnowski and Tzyy-Ping Jung at Salk Institute, Dr. Makeig has developed a neural network algorithm for real-time alertness monitoring based on EEG data collected from four to five points on the scalp. This original algorithm provided a capability to monitor an individual's alertness and thereby predict his or her errors in a vigilance task. The still-greater accuracy of an advanced version of this algorithm has recently been demonstrated in a paper published by Dr. Makeig and

colleagues in the *IEEE Transactions on Biomedical Signal Processing*. Results of this and related research are available on the world wide web (<http://labhsp.nhrc.navy.mil/>).

Dr. Makeig's research advances work done first at NHRC in the 1960's by former NHRC Scientific Director Dr. Laverne Johnson and associates, who noted the potential for real-time alertness monitoring based on EEG, but lacked the modern computer and neural network technology necessary to create a working system. Currently, Dr. Makeig is collaborating with LCDR Karl Van Orden of NHRC and researchers at Salk Institute, the University of California, San Diego, and NRAD on parallel streams of applied and basic research in operator state assessment based on EEG and eye tracking information. They are hoping to soon test a portable version of an EEG-based system to demonstrate its feasibility in monitoring alertness in an advanced command and control work station and gravity-induced loss of consciousness (GLOC) in Navy



and Marine Corps jet pilots. This operator status technology will provide the capability to more efficiently distribute the workload between the operator and the machine and marks a significant advance in human-system interface.

The NHRC research team, in collaboration with researchers at the University of Pennsylvania, is also assisting the National Highway Traffic Safety Administration in monitoring the alertness of truck drivers and developing appropriate drowsiness countermeasures during night driving. These tests are expected to involve prototypes of new "dry" electrode chips that can be worn comfortably by operators under a baseball cap or earphone head band without special

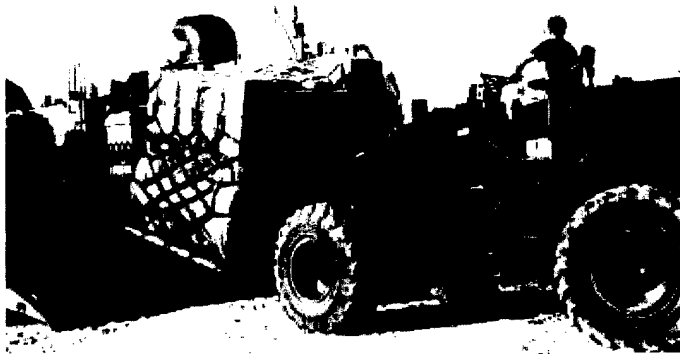
skin preparation.

In the future, related psychophysiological monitoring methods could be used to detect when an operator fails to show a brain response to an important warning signal, and could increase the efficiency of computer-based training. With LCDR Neri of the NASA Ames fatigue research program, Dr. Makeig has proposed that future Navy and Marine Corps commanders have available an integrated alertness and fatigue management system to help them maintain the readiness-for-duty of their personnel under high circadian-stress conditions. Such a system might combine noninvasive crew rest monitoring and intelligent work/rest scheduling software with on-line cognitive assessment of operators at key work stations.

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### **NHRC's Operations Research Division Streamlines Forward Medical Supplies for the Marine Corps**

**H**aving the right amount and type of medical supplies and equipment is essential for medical readiness. While insufficient medical materiel may result in manpower losses, attempts to move excessive quantities of supplies must be avoided



because scarce fiscal resources and transportation assets are diverted. The Commandant of the Marine Corps requested that NHRC review the Authorized Medical and Dental Allowance Lists (AMAL/ADALs) so that they accurately reflect changes in Marine Corps doctrine and policy as well as the anticipated reduction in casualty rates. Mike Galarneau and his colleagues Dr. Paula Konoske, Kevin Mahoney, and Kristee Emens-Hesslink are currently reviewing the medical supply and equipment lists for the Marine

Corps' far forward medical treatment facilities.

Working closely with Marine Corps medical professionals, Mr. Galarneau linked the Echelon I and II medical tasks required to treat patients with specific patient condition codes established by the defense medical standardization board and compiled lists of the supplies and equipment required to perform each task. More than 85 subject matter experts from the 1<sup>st</sup>, 2<sup>nd</sup>, and 4<sup>th</sup> Medical Battalions, the 1<sup>st</sup> and 2<sup>nd</sup> Force Service Support Groups (FSSG), and the Naval Hospitals Camp Pendleton and Camp Lejeune reviewed treatment briefs, tasks, supplies, and equipment and determined their usefulness for Marine Corps Echelons I and II. The result of this work is a model of Echelon I and II supply stream that establishes a clinical requirement for each item used to support forward medical care.

AMALs containing the Echelon II lab and x-ray supplies and equipment were evaluated first. Studies showed that substantial reductions could be made in the number of items required, weight, and cube of the proposed AMALs when compared to the current Marine Corps AMALs. For example, 34 items in the proposed laboratory equipment AMAL could be eliminated with a corresponding 28% reduction in weight and 10% reduction in space, while in the proposed x-ray equipment AMAL there was a 14% weight savings and a net space savings of 4%. By establishing the clinical requirement for each item pushed forward, the NHRC model was able to reduce the logistical burden carried by Marine Corps units. This approach also produces an audit trail for each item because only items that can be clinically related to a treatment task conducted in theater are considered for inclusion in the AMALs. The Marine Corps Combat Development Center has endorsed NHRC's review process and has recommended that the process be used for the evaluation of the remaining AMALs.

Currently, Battalion Aid Station and Echelon II Operating Room AMALs are being revised. A computer program that estimates supplies and equipment requirements based on a given patient stream distribution has been designed and is under development. This will allow the current configuration to be revised using information such as the type of conflict anticipated, the expected duration, and changes in medical doctrine. Additional efforts are underway to use this methodology to evaluate the AMAL/ADALs of shipboard medical departments.

## NHRC's Environmental Physiologists Evaluate Anti-Exposure Suits for Use During Shipboard Flooding Operations

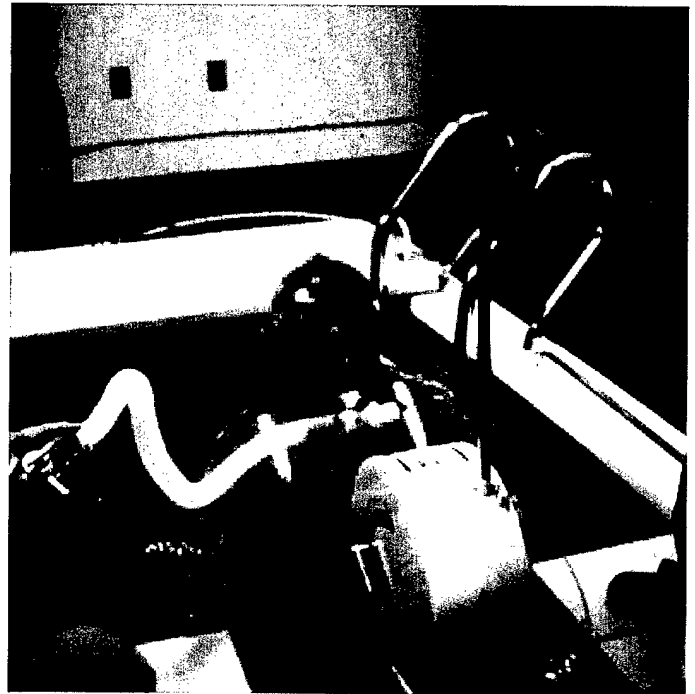
Shipboard flooding as a result of mechanical failures, mismanagement of ballast, or breaches of the ship's hull often requires damage control personnel to work in cold ocean water. One of the most serious hazards of cold-water exposure is hypothermia caused by loss of body heat. Because the thermal conductivity of water is 20 to 25 times that of air, cold water quickly absorbs most of the heat which reaches the skin and poses a serious hazard for damage control personnel.

Naval personnel normally perform damage control for shipboard flooding operations dressed in dungarees or engineering coveralls. However, these garments have a minimal insulation capacity and do not provide adequate protection for cold-water exposure. Therefore, Dr. Don Hagan and Lt. Barry Cohen are working with the Personal Protection Division of the Naval Sea Systems Command to identify and evaluate a number of anti-exposure suit concept-designs for possible use by damage control personnel.

There are two basic types of anti-exposure suit designs which prolong staytime in cold air or ocean waters. These are called "wet" suits and "dry" suits. "Wet" suits usually cover the whole body and allow cold water to seep up the legs and down the arms to eventually cover the entire body surface. Protection from the cold is provided when this water layer between the skin and the inside of the suit is warmed sufficiently to reduce convection heat loss from the skin. On the other hand, "dry" suits prevent water from making direct contact with the skin, thus protection is greater because the air layer between the skin and suit serves as another barrier to heat loss.

In an initial set of studies supported by the Office of Naval Research, NHRC researchers evaluated two "wet" suits and one "dry" suit which were already in the Navy supply system but were not designed for damage control operations. These studies indicated that the "dry" suit, which was the CWU-62P anti-exposure

coverall worn by Navy pilots, afforded the best protection, but was difficult to don and costly to manufacture. Subsequent tests evaluated three "dry" suits in a realistic flooding problem in which subjects performed



a pipe patching task while they were progressively immersed in cold water. In these tests, a British-made whole-body suit manufactured by MultiFabs Survival, Inc. provided the best overall protection against decreases in body temperature; however, a suit developed by the Naval Clothing and Textile Research Facility was nearly as effective and proved to be more durable under simulated operational conditions. Additional findings from laboratory and field studies also revealed a need to identify pliable waterproof work gloves to keep the fingers and hands dry and warm to maintain dexterity and patching effectiveness. These preliminary findings will aid in the future development of a cost effective, easily donned, anti-exposure "dry" suit designed specifically for shipboard flooding repair operations.

For further information contact NHRC at

(619) 553-8400 FAX (619) 553-9389

E-mail: CO@NHRC.Navy.mil or SD@NHRC.Navy.mil

Visit our web site: <http://www.nhrc.navy.mil>

# NHRC UPDATE

July 1997

Issue No. 6

This update is published quarterly to highlight NHRC contributions to the Navy and Marine Corps as well as the scientific community.

## NHRC Researchers Combat Emerging Illness Threats Among U.S. Military Personnel

Newly described or more virulent forms of infectious diseases are emerging throughout the world and causing epidemics at an alarming rate. Outbreaks once isolated to one city or country can spread exponentially through the convenience of modern air travel. A new hepatitis virus in Africa or a new strain of cholera in Latin America has the potential to infect a myriad of other countries at any given time, including the United States. Due to crowding and frequent travel to exotic locales, military personnel have been among those at highest risk for large infectious disease epidemics. Service men and women have often acquired infectious agents endemic to the region of their deployment then later developed the clinical disease in their native lands. Such diseases have occasionally spread to other citizens and been misdiagnosed by unsuspecting medical personnel. It is imperative that these threats be recognized and contained. Often the first step toward developing new preventive strategies is understanding the nature of the pathogen.

As a component of the Department of Defense's global emerging illness surveillance efforts, the Naval Health Research Center is conducting epidemiological studies concerning a number of emerging pathogens. CAPT Gregory Gray, MC, USN and his colleagues are collaborating with numerous nonfederal and federal scientists in examining several emerging illness threats including those caused by invasive *Streptococcus pyogenes* ("flesh-eating bacteria"), antibiotic resistant *Streptococcus pneumoniae*, adenoviruses, *Bordetella pertussis* (whooping cough), and several human mycoplasmas.

Diseases caused by these pathogens can be extremely debilitating to troop readiness and welfare. For example, U.S. military recruits have been some of

the first exposed to more virulent, and potentially fatal, *S. pyogenes* infections, including acute rheumatic fever, necrotizing fasciitis and streptococcal toxic shock syndrome. During 1989, U.S. marines in Southern California suffered the largest outbreak of *S. pneumoniae* since the advent of antibiotics with 128 hospital admissions. Recently, the Naval Medical Center, San Diego has reported a very high prevalence of penicillin resistance among its clinical *S. pneumoniae* isolates.

Some emerging illness problems are man made. Adenovirus epidemics in military populations have been



Adenovirus (Penton region)

effectively controlled with adenovirus type 4 and 7 vaccines for nearly 30 years. But recently, the vaccine manufacturer ceased production and recruit epidemics of adenovirus are eminent. These epidemics will severely impact military training and may overwhelm



military treatment facilities. CAPT Gray and his staff have established a network of 15 surveillance hospitals to combat this and other emerging respiratory pathogens. Investigators will document adenovirus infections and isolate the serotypes affecting service men and women. These efforts will help to produce a more viable vaccine in the future. This network will also be used to conduct surveillance for invasive *S. pyogenes* and antibiotic resistant *S. pneumoniae*. The information gained from these studies will help the military medical community prepare for and prevent outbreaks of these respiratory disease threats.

Additionally, in collaboration with the FDA and several U.S. and foreign universities, NHRC is conducting cross-sectional analyses, cohort studies, outbreak investigations, and clinical trials concerning other emerging pathogens such as *B. pertussis*, *Mycoplasma pneumoniae*, and *Ureaplasma urealyticum*.

In the recent past, cases of adult *B. pertussis* (whooping cough) have been on the rise in the United States. To examine the prevalence of adult infection in military populations, CAPT Gray and colleagues studied 120 U.S. Marines who reported 7 or more days of cough while undergoing training (from November 1993 to July 1994). This study demonstrated that *B. pertussis* infection may have caused 17% of these illnesses. Such high morbidity may suggest the future military use of newly developed acellular pertussis vaccines.

Military personnel undergoing training often suffer from pneumonia and frequently the etiologic, or



causal, agents are not identified. From August 1993 through April 1994, CAPT Gray and associates studied 204 U.S. Marines who were hospitalized in Southern

California with radiographically confirmed pneumonia. The data collected revealed that *M. pneumoniae* caused a third of these pneumonias but was frequently not suspected. These data are important to military clinicians in designing more appropriate therapies for pneumonia.

In an effort to reduce the morbidity of acute respiratory disease (ARD), and in effect decrease the incidence of these emerging respiratory illnesses, an additional study was conducted. CAPT Gray and collaborators sought to reduce the threat of several ARD pathogens by administering a preventive dose of a new long-acting oral antibiotic, azithromycin, in lieu of the older technology of rendering monthly injections of penicillin. The study found that azithromycin was well tolerated and is an effective alternative in preventing bacterial respiratory infections among military populations.

In collaboration with University of Alabama at Birmingham scientists, CAPT Gray's research team is also examining over 10,000 pregnant women in an effort to determine why *U. urealyticum*, a mycoplasma frequently found in the vaginal tract, may cause poor pregnancy outcomes in some women. This study will facilitate the future design of rational *U. urealyticum* treatment strategies.

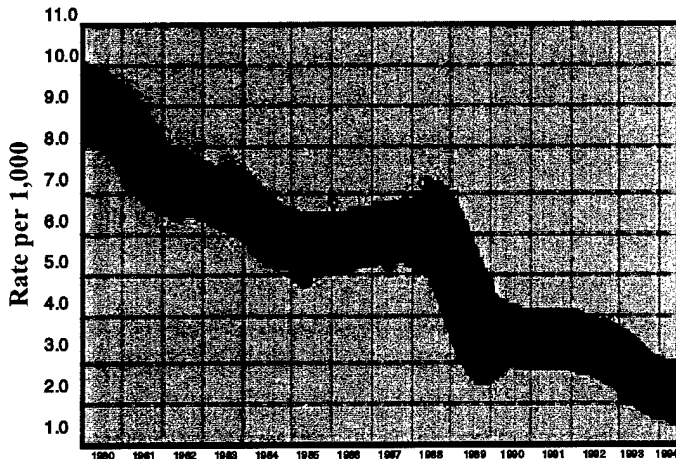
Given their unique location near large populations of recruits and operational forces, NHRC researchers are contributing much to reducing the impact of emerging illnesses. Their study findings will affect change in current medical procedures, health education and preventive medicine practices. This vital information will have a great influence on military and national public health policy makers resulting in improved military readiness and reductions in medical care costs.

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### NHRC Scientists Develop A User-friendly Medical Information System for the PC

Each year, approximately 49,000 U.S. Navy enlisted personnel are hospitalized. Because these medical data are recorded electronically, vast amounts of medical information can be extracted for medical planners and researchers. Combining this hospital information with select demographic data from

personnel files provides enormous potential for managing health promotion and prevention programs. Increased rates of morbidity can be detected, and temporal trends can be followed to assess the efficacy



Time-series display for a diagnosis

of interventions or identify new disease threats. In the past, however, the ability to rapidly answer basic questions regarding disease and injury rates in the U.S. Navy and their potential association with particular groups or occupations was hindered by the absence of a user-friendly database which contained both hospitalization records and demographic data. Access to these separate "administrative" databases was difficult and the analysis of the data was complex and time consuming.

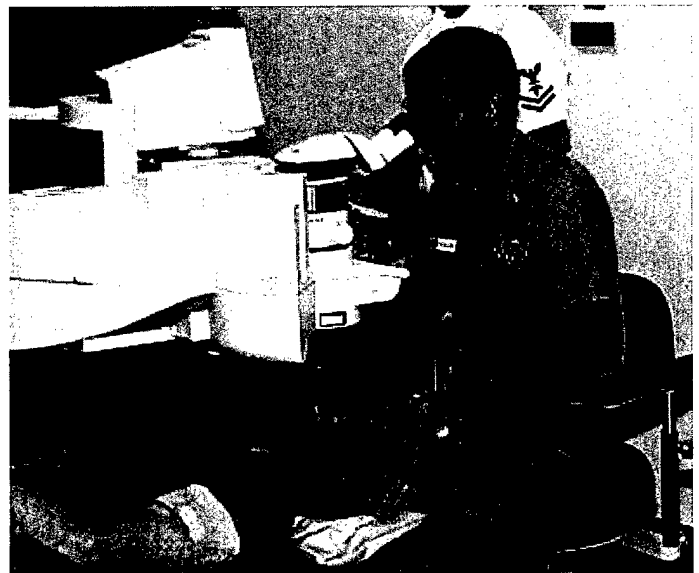
In an attempt to solve this problem, Mr. Martin White of the Naval Health Research Center, in collaboration with Dr. Ivan Show of Southwest Research Associates, were funded by the Office of Naval Research to develop a computerized medical information system called EPISYS. This system integrates the data from large, complex, dispersed data files into a single user-friendly program that greatly improves accessibility, and allows for a more complete analysis of the data. Age-adjusted rates of illness or injury can be calculated automatically and compared across various occupations or groups. In addition, historical trends for any disease or illness can be rapidly assessed. Using this PC-based system, adverse health events resulting in hospitalizations can be monitored, and interventions targeted for those occupations or groups of individuals who are shown to have an increased risk for a particular disease or disorder. Currently EPISYS contains 1.1 million medical records for all U.S. Navy enlisted personnel from 1 January

1980 through 31 September 1994. Work is in progress to include Naval Officers and Marine Corps personnel, and to expand the inpatient data file to include geographically-linked outpatient data from shipboard medical departments.

Two studies recently completed using EPISYS were "Hospitalization Rates of Tuberculosis in U.S. Navy Enlisted Personnel: A 15-Year Perspective" (*Military Medicine*), and "Job Demands and Back Injury in Navy Personnel". The goal of EPISYS is to provide both a system for disease surveillance, and a flexible user-friendly interface so that medical researchers, planners, clinicians, and administrators have immediate access to large volumes of medical data and statistics in a form which furthers the Navy's goal of health promotion and disease prevention.

### NHRC Scientists Collaborate with Naval Medical Center, San Diego to Evaluate Photorefractive Keratectomy

One of four Navy personnel is nearsighted (myopic) and require glasses or contacts to achieve optimal vision. In 1993, over 100,000 spectacles were issued to sailors with low to moderate nearsightedness who could have been treated with a recently developed refractive surgical technique called photorefractive keratectomy (PRK). Unlike radial keratotomy (RK), which uses a scalpel to create deep incisions in the cornea to flatten the central area and reduce refractive power, PRK uses a chemically cool



ultraviolet excimer laser to remove corneal tissue with microscopic precision that is unattainable with RK. The strong interest in PRK for use in the military is based on its predictable outcome, ability to maintain corneal integrity and refractive stability, and elimination of glasses or contact lenses.

Eye glasses have inherent problems when used with operational equipment, such as night vision goggles (NVGs), helmet mounted targeting sights, biological/chemical protective headgear and diving masks. They can also restrict peripheral vision and reduce clarity in inclement weather or during twilight. While contact lenses are a viable alternative to spectacles, they can produce potentially sight threatening medical problems (e.g., bacterial infections and conjunctivitis) and may not be suitable in all operational environments. Soft contact lenses cannot be worn with standard issue biological/chemical gas masks. Hard contact lenses are not tolerated well in dry, hot, dusty environments. Contact lenses can be displaced or fall out during military exercises; for example, an astonishing 26% of USAF pilots wearing contact lenses reported lens displacement during flight!

PRK may be a safe alternative for individuals intolerant to glasses and contact lenses or for personnel who work under conditions that exclude their use, such



as Navy SEALs during operations (e.g., parachuting, diving, and with NVGs). Based on the favorable results of civilian clinical trials, the U.S. Navy began a series of PRK investigations to explore clinical success and

operational significance. After start-up funding provided by the Office of Naval Research, the U.S. Special Operations Research, Development & Acquisition Command (SORDAC) funded NHRC, in collaboration with the Naval Medical Center, San Diego, to initiate the Navy's PRK program. To date, 173 military patients have been enrolled in two completed and two ongoing FDA phase III clinical trials utilizing the Summit and VISX excimer lasers. Initial results, published in the journal *Ophthalmology* by CDR Schallhorn, MC, USN and his colleagues demonstrate that PRK is a very safe, accurate and effective treatment for correcting low to moderate myopia. All patients had a substantial improvement in uncorrected vision (i.e., 99% no longer needed glasses or contact lenses), and no patient experienced a loss in best corrected vision. The performance of a military task (i.e., rifle shooting accuracy) was also significantly improved after the surgery. While complete recovery from PRK occurred within 1 to 3 months for most patients, one patient did not reach refractive stability for 9 months, and one patient reported a problem with headlight glare.

While it is clear that PRK's potential benefits for military personnel are very significant, further systematic and precise evaluations are critical. Continuing research efforts by Mr. Sandor Kaupp at NHRC and his colleagues at the Naval Medical Center, include extensive pre- and postoperative refractive and acuity evaluations, measurements of intraocular light scatter (glare) and contrast sensitivity, task measurements (e.g., pistol shooting accuracy under twilight conditions), and a subjective evaluation of PRK using a comprehensive questionnaire developed by Dr. Linda Bourque, School of Public Health, UCLA. Prior to its implementation for Navy-wide use, it is important to evaluate convalescence after treatment, and identify those occupations and individuals who are well suited to the procedure. This exciting, high tech, medical procedure has enormous potential to broaden selection opportunities in specialized ratings, such as aviation and diving, and dramatically improve the operational performance of Navy and Marine Corps personnel under difficult and varied field conditions.

For further information contact NHRC at

(619) 553-8400 FAX (619) 553-9389

E-mail: CO@NHRC.Navy.mil or SD@NHRC.Navy.mil

Visit our web site: <http://www.nhrc.navy.mil>

# NHRC UPDATE

October 1997

Issue No. 7

*This update is published quarterly to highlight NHRC contributions to the Navy and Marine Corps as well as the scientific community.*

## NHRC Researchers Employ Cutting Edge Technology to Help Develop New Marine Boot

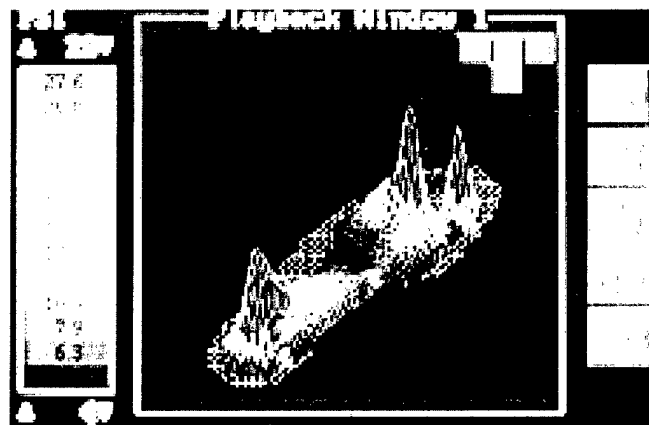
The combat boot is one of the most important pieces of the U.S. Marine Corps standard military issue. Military requirements demand a boot that is comfortable, durable, and enhances the performance capabilities of the marine. However, previous boot designs restricted natural gait patterns and provided minimal shock absorption during physical activity. These factors often led to an early onset of fatigue, muscular pain, and possible injury.

As part of an on-going program to reduce musculoskeletal injuries in Marine Corps and Navy train-



pects of current commercially available boots and stock system boots and to provide a recommendation for an improved design of a Marine Corps combat boot.

One of the biomechanical risk factors for a musculoskeletal injury is impact shock or shock waves generated by repeated impact between the foot and the ground. These shock waves, which are generated



at the foot/shoe interface are transmitted through the musculoskeletal tissues of the lower limb and spine, are thought to be associated with many different kinds of musculoskeletal injuries. These injuries are particularly problematic in U.S. military recruit populations where individuals are exposed to sudden increases in the volume and intensity of physical training. Studies of these recruit populations have reported injury rates from 26% to 46% for male trainees and 45% to 54% for female trainees. These injuries frequently result in lost training time and medical attrition, producing a significant operational and fiscal burden.

The researchers from this multidisciplinary team tested existing Marine Corps leather and jungle boots for baseline performance characteristics and

ing populations, researchers at NHRC were asked to collaborate with MARCORSYSCOM in the development of a new infantry combat boot for the Marine Corps. The NHRC research team included Captain Stephanie Brodine, MC, USN; Commander Rick Shaffer, MSC, USN; Commander Travis Luz, MSC, USN; and Ms. Karen Maxwell-Williams. This team worked with Dr Kenton Kaufman of the Biomechanics Laboratory at Children's Hospital, and John Hagy, a footwear expert, to evaluate the biomechanical as-

compared them with a panel of commercially available high-tech boots. The biomechanical measurements fell into two categories: (a) physical tests aimed at mechanically characterizing the entire boot or the boot's component materials, and (b) tests using human subjects to quantify various physical properties and the body's response to wearing boots. The human biomechanical tests were selected on the basis of existing data correlating specific biomechanical characteristics and the likelihood for musculoskeletal overuse injury. Specific emphasis was placed on shock absorption, energy return, and stability. Biomechanical testing was also performed on a high-performance running shoe.

The prototype sole developed from these tests has a rubber Vibram outsole for durability and a polyurethane midsole and insole for cushioning. The shock



New stock system infantry combat boot

absorption and performance characteristics of these materials are significantly superior to the current military issue boots and similar to a running shoe. The final specifications for the new boot were derived from focus groups and wear tests with Marine Corps Infantry and Fleet Marine Force personnel. Features include a softer, more flexible leather which is waterproof, with a Gore-Tex membrane and Cordura uppers. In addition to the increased cushioning of the sole, there is increased cushioning throughout the boot with a semi-wedged midsole/outsole for better traction and ground contact. Another important feature is the revised lacing system that extends further down the toe to maximize foot fit and function.

The development of the new Marine Corps boot, scheduled to be in the stock system by November 1997, provides an excellent example of how Navy medical researchers at NHRC work hand-in-hand with

operational forces, academics, and private industry to bring world class science to bear on solving operational problems in the Navy and Marine Corps.

### Long-term NHRC Follow-up of Health and Readiness Shows Sailors Staying Fit

It has been estimated that more than 40% of all illness and premature death in the United States is directly related to personal life-style choices, particularly tobacco and alcohol use, fatty diet, and lack of exercise. With nearly half a million people on their active payroll, and more than one million retirees and dependent family members who are also health care beneficiaries, the U.S. Navy constitutes one of the nation's largest employers offering health care coverage to its personnel. As such, the Navy has a keen interest in reducing costly diseases of life-style, as well as in meeting the demand that its fighting force be fit, healthy, and ready to perform at all times. In 1982, the Navy established a comprehensive Health and Physical Readiness Program to promote health and physical fitness, set minimum standards for fitness and weight control, and emphasize the need for all active-duty personnel to participate in life-style behaviors that promote good health. Researchers at the Naval Health Research Center were instrumental in establishing the Navy's physical readiness standards, developing the methods and equations for assessing body fat, and initiating a comprehensive program to evaluate health promotion interventions, such as smoking cessation, alcohol rehabilitation, and weight control.

In a recent NHRC study to explore trends in health behaviors and physical readiness, Ms. Linda Trent and Ms. Suzanne Hurtado conducted a follow-up survey of over 5,500 Navy personnel who had participated in one or more of the earlier NHRC studies. This effort, which was supported by the Office of Naval Research, resulted in a sample of more than 2,000 participants with matched data from the 1983/1986 baseline studies and the 1994 follow-up. In this study both men and women demonstrated increased physical fitness over the years. These fitness changes

were measured in terms of age- and sex-adjusted classification scores on the 1.5-mile run, sit-ups, and push-ups tests. There was also a highly significant improve-



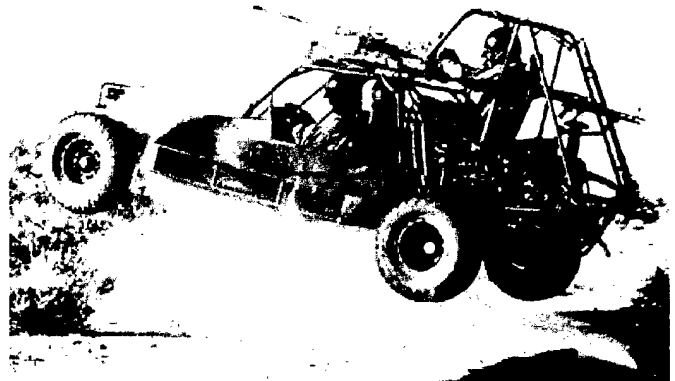
ment in dietary choices among both men and women over the 11 years of the study. Cigarette smoking and alcohol use declined significantly in men, particularly among those assigned aboard ship, while women showed no change in their use of either substance. At the end of the follow-up, there was no statistically significant difference between men and women in the percentage of smokers; however, women were drinking significantly less alcohol than men (about 2 drinks per week versus more than 4 drinks per week). The only significant fitness decrements were in body composition (2% increase in body fat) and a 7% increase in people reporting high blood pressure.

Overall, the authors found that these career Navy people were (1) maintaining a vigorous level of physical activity, (2) eating a significantly more healthful diet, (3) exhibiting markedly greater muscle mass, (4) sustaining body fat levels that remained within the Navy's established limits, and (5) demonstrating significantly improved physical fitness scores despite being 8 to 11 years older. Much of the credit for these effects is believed to be due to the fact that Navy personnel have been influenced by the Navy's health promotion program for more than a decade. The study concluded that these longitudinal participants represent the career naval force whose somewhat older, higher-ranked, service-committed personnel exemplify a new level of physical readiness and serve as models for more junior members of the fleet.

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## NHRC Scientists Develop An Interactive Medical Training Program For Special Operations Forces

Corpsmen, medics, and other health-care providers attached to Special Operations forces are required to maintain their skills in a wide variety of areas. This is normally accomplished through group training classes. Providing group training classes for these personnel, however, poses a special problem. Typically, one corpsman or medic is attached to each Special Operations unit or platoon. These platoons are frequently required to be away from their home bases, often in distant and remote locations around the globe, for extended periods. Their missions are often in areas where there are no hospitals or other support facilities. Since the units usually



Special Operations personnel on maneuvers in the desert

operate independently, it is a rare occurrence when all the corpsmen and/or medics from a particular command are available for group training at the same time. Therefore, medical training needs to be provided on an individual basis without the scheduling restraints of a classroom setting. Mr. Larry Hermansen and Ms. Hoa Ly of the Naval Health Research Center have developed a computer-based, interactive medical training system as an alternative to classroom training.

The Special Operations Interactive Medical Training Program (SOIMTP) was designed to meet this goal. SOIMTP is a specialized interactive system with thousands of question-and-answer items in a variety of subject areas, or modules, that are relevant to Special Operations medical personnel. Each module has approximately 100 multiple-choice ques-

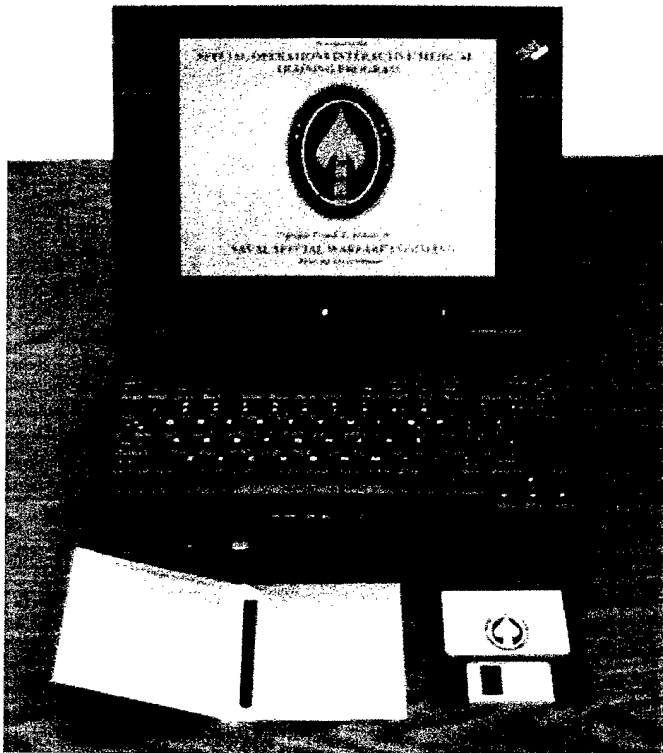
tions. The questions were developed by medical officers and senior hospital corpsmen with special knowledge of the subject areas and the unique environments in which Special Operations are conducted. The first prototype system, released in 1994, consisted of three training modules (Diving Medicine, Exercise Injuries, and Combat Casualty Care). This system was developed for hospital corpsmen attached to Naval Special Warfare units. After successful testing in the field, a second version with 18 modules was developed. The second version, released in March 1995, was distributed to Naval Special Warfare units and to medical personnel attached to Marine Corps, Air Force, and Army Special Operations forces. The third version, with 20 modules, was distributed in October 1996. It is presently being used by medical personnel

from all services under the U.S. Special Operations Command.

SOIMTP is provided to users on a floppy disk and can be installed on almost any standard personal computer. The disk comes in a specially designed folder, that fits in a shirt pocket and has a quick reference user's guide printed on the inside. SOIMTP first allows the user to pick a subject area or module from the main menu.

Examples of the modules include Preventive Medicine, Casualty Management, Exercise Injuries, and Pharmacology. The user may also choose either the "practice" or "test" mode for the session. In the "practice" mode, the user can attempt each question as many times as necessary and is not allowed to continue on to the next question until the correct answer has been selected. When the correct answer has been selected, the program notifies the user and provides a reference so the user can verify the correct choice or learn more about the topic of that particular question. In the "test" mode, the user is allowed only one chance to answer each question before the next question is presented. The program keeps score and, at the end of the session, the scores are presented along with the user's response to each item and whether the response was correct or incorrect. These scores can be saved or printed.

The training accomplished via the SOIMTP may ultimately save lives by helping to improve the knowledge and skills of primary medical-care personnel attached to Special Operations forces. This project is funded by the U.S. Special Operations Command, through the Naval Medical Research and Development Command. The program manager is CAPT Frank K. Butler, Naval Special Warfare Command, chairman of the United States Special Operations Command Biomedical Research and Development Program.



For further information contact NHRC at  
(619) 553-8400 FAX (619) 553-9389  
E-mail: CO@NHRC.Navy.mil or SD@NHRC.Navy.mil  
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